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The PHOTOFACT Servicer

March 1, 1950 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ Volume 9, Nos. 87 & 88

EXCERPTS FROM ARTICLE 810 of the NATIONAL ELECTRICAL CODE (Reproduced through Courtesy of the RMA)

The following material, selected from Article 810 of the National Electrical Code (revised as of June, 1949) is particularly applicable at the present time because of the widespread activity in TV antenna installation. The excerpted data was selected on the basis of general receiving antenna requirements and is reproduced through courtesy of the RMA.

Antenna Systems - General

Material. Antenna, counter-poise and lead-in conductors shall be of hard copper, bronze, aluminum alloy, copper-clad steel or other high-strength, corrosion-resistant material. Soft-drawn or medium-drawn copper may be used for lead-in conductors where the maximum span between points of support is less than 35 feet.

Structures. Metal structures supporting antennas shall be permanently and effectively grounded.

Size of Wire-Strung Antenna and Counter-Poise.

A. Outdoor antenna and counter-poise conductors for receiving stations shall be of a size not less than given in the following table:

Minimum Size of Conductors When Maximum Open Span

Material	Length is - Less than 35 ft.	35 ft. to 150 ft.	Over 150 ft.
Aluminum alloy, hard-drawn copper	19	14	12
Copper-clad steel, Bronze or other high-strength material	20	17	14

For very long span lengths larger conductors will be required, depending on the length of the span and the ice and wind loading.

B. Self-Supporting Antennas. Outdoor antennas, such as vertical rods or dipole structures, shall be of non-corrodible materials and of strength suitable to withstand ice and wind-loading conditions.

Clearances

A. On Buildings Outside. Lead-in conductors attached to buildings shall be so installed that they cannot swing closer than two feet to the conductors of circuits of 250 volts, or less, or ten feet to the conductors of circuits of more than 250 volts, except that in the case of circuits not exceeding 150 volts, if all conductors involved are supported so as to insure permanent separation, the clearance may be reduced but shall not be less than four inches. The clearance between lead-in conductors and any conductor forming a part of a lightning rod system shall be not less than six feet unless proper bonding is accomplished.

B. Antennas and Lead-Ins - Indoors. Indoor antennas and indoor lead-ins shall not be run nearer than two inches to conductors of other wiring systems in the premises unless (1) such other conductors are in metal raceways or cable armor, or (2) unless permanently separated from such other conductors by a continuous and firmly fixed non-conductor such as porcelain tubes or flexible tubing.

Protectors

Lightning Arresters - Receiving Stations. Each conductor of a lead-in from an outdoor antenna shall be provided with a lightning arrester approved for the purpose, except that if the lead-in conductors are enclosed in a continuous metallic shield the lightning arrester may be installed to protect the shield or may be omitted if the shield is permanently grounded.

Lightning arresters shall be located outside the building, or inside the building between the point of entrance of the lead-in and the radio set or transformers, and as near as practicable to the entrance of the conductors to the building. The lightning arrester shall not be located near combustible material, nor in a hazardous location.

Grounding Conductors - General

Material. The grounding conductor shall, unless otherwise specified, be of copper, aluminum, copper-clad steel, bronze, or other corrosion-resistant material.

Run in Straight Line. The grounding conductor shall be run in as straight a line as possible from the antenna mast and/or lightning arrester to the grounding electrode.

Size of Protective Ground. The protective grounding conductor for receiving stations shall be not smaller than No. 14 copper, or No. 12 aluminum, or No. 17 copper-clad steel or bronze, provided that where wholly inside the building it shall not be smaller than No. 18.

Interior Installation - General

Radio Noise Suppressors. Radio interference eliminators, interference capacitors or radio noise suppressors connected to power supply leads shall be of a type approved for the purpose. They shall not be exposed to mechanical injury.

Clearance from Other Conductors. Except as provided in Article 640, all conductors inside the building shall be separated at least 4 inches from the conductors of any other light or signal circuit unless separated therefrom by conduit or some firmly fixed nonconductor such as porcelain tubes or flexible tubing.

* * *

SURPLUS ELECTRONIC MATERIAL

We have many requests for schematics and other data covering surplus electronic equipment. For those who are interested, The Department of Commerce, Office of Technical Services' publication No. 98487, contains 44 pages of such data. This booklet is available by writing the Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., requesting a copy and enclosing $1. The same office has a list of specific technical manuals covering this equipment. They will furnish free of charge, a price list of such manuals as they have.

FIELD EXPERIENCES

For every service "Field Experience" published, we issue a certificate good for one PHOTOFACT Folder Set. Awards are issued at the time of publication. Since it is impossible to verify the accuracy of contributions, we cannot be responsible for either the diagnosis made of the receiver trouble, or for the results obtained by following the suggested repair routine. All contributions become the property of Howard W. Sams & Co., Inc.

* * *

RCA Chassis 618C-616A&H
Photofact Set No. 56, Folder No. 20

Complaint: Receiver has loud hum when station is tuned in.

Cause: Check 6J6 (Item 1) socket, pin 5 grid. This grid is returned to AVC through 3.9 megohm resistor. Apparent corrosion between the wafers of the 6J6 socket allows a 500M to one megohm leakage resistance to form between the various pins and the center (shield) terminal which is grounded.

Remedy: Replace socket: I have tried cleaning but it is impossible to remove all corrosion.

Kenneth Horsfall
619 E. Third Street
Anaconda, Montana

Editor's Note: This might happen in almost any wafer socket.

* * *

PHILCO Model 49-909
Photofact Set No. 55, Folder No. 17

Complaint: Noise, especially on fairly loud volume and high frequency end of dial. It appeared to be a static-like oscillation.

Remedy: I cured it by running an extra wire to speaker case and soldering it to radio chassis; thus grounding speaker.

Paul Hartman
Arnold, Nebraska

Editor's Note: This same remedy may apply to several other receivers.

GENERAL ELECTRIC G Series
Models 805, 806, 807, etc.
Photofact Set No. 78, Folder No. 7

We have noticed sets in this series whose contrast keeps changing from light to dark and back to light again at a regular frequency. The control grid of the first video IF is connected to B- through a 10K resistor and an .05 MFD condenser on later models. This condenser is generally the cause of the trouble although it may check O. K. It is sometimes necessary to increase the size of this condenser to 0.1 MFD to eliminate the trouble.

Occasionally a set will be found with one, two or three vertical white lines on the screen. If these can't be tuned out with the fine tuning control replace the 19BG6. The tube will check O. K., but a new one will remedy the trouble.

AVIOLA Model 502A

Complaint: The set may become extremely noisy or the signal may cut off and on.

Cause: The antenna lead is connected directly to a metal back plate and this plate will be shorted to the chassis through the screws which hold it on.

Remedy: Make sure these screws are tightened down and also be sure the back plate is insulated from the screws - - if necessary a small piece of spaghetti can be placed over the screw to insulate it.

Editor's Note: Both above experiences were submitted by:

Dean R. Cannon
961 East 21st, South, Salt Lake City, Utah

* * *

CROSLEY Model 9-407
Photofact Set No. 66, Folder No. 6

Complaint: No horizontal deflection.

Cause and Remedy: After checking yoke to be sure it is not open, check 220 MFD, 1500 volt mica capacitor connected between terminals 4 and 5 of flyback transformer. This capacitor will no doubt be found shorted. Replace with one of a higher voltage rating.

Henry W. Finch, North Jersey Electronics
441 Orchard Street, Englewood, N. J.

PHILCO Model 46-1209
Photofact Set No. 13, Folder No. 24

Complaint: Set sounded alive but no stations could be tuned in.

Cause: Plate voltages checked close except high voltage on 7F8 tube. Trouble traced to R52 which was shorted and R53 was burned up.

Remedy: Replacement of these parts, located beneath the wafer switch assembly, cleared the trouble.

Thomas H. Ellery
1661 Oakland,St. Clair, Michigan

* * *

EMERSON Model 619
Photofact Set No. 76, Folder No. 11

Complaint: Brightness on picture would almost fade out and adjusting brightness control would not bring it back.

Cause: After replacing bad tubes and defective high voltage condenser the results were no better. After checking voltages across selenium rectifiers, I found that the voltage would drop when testing across rectifier No. M4.

Remedy: I replaced this rectifier with a 200MA type and set worked perfectly.

Walter L. Deiermann
7240 Normandy Place
Normandy 21, Mo.

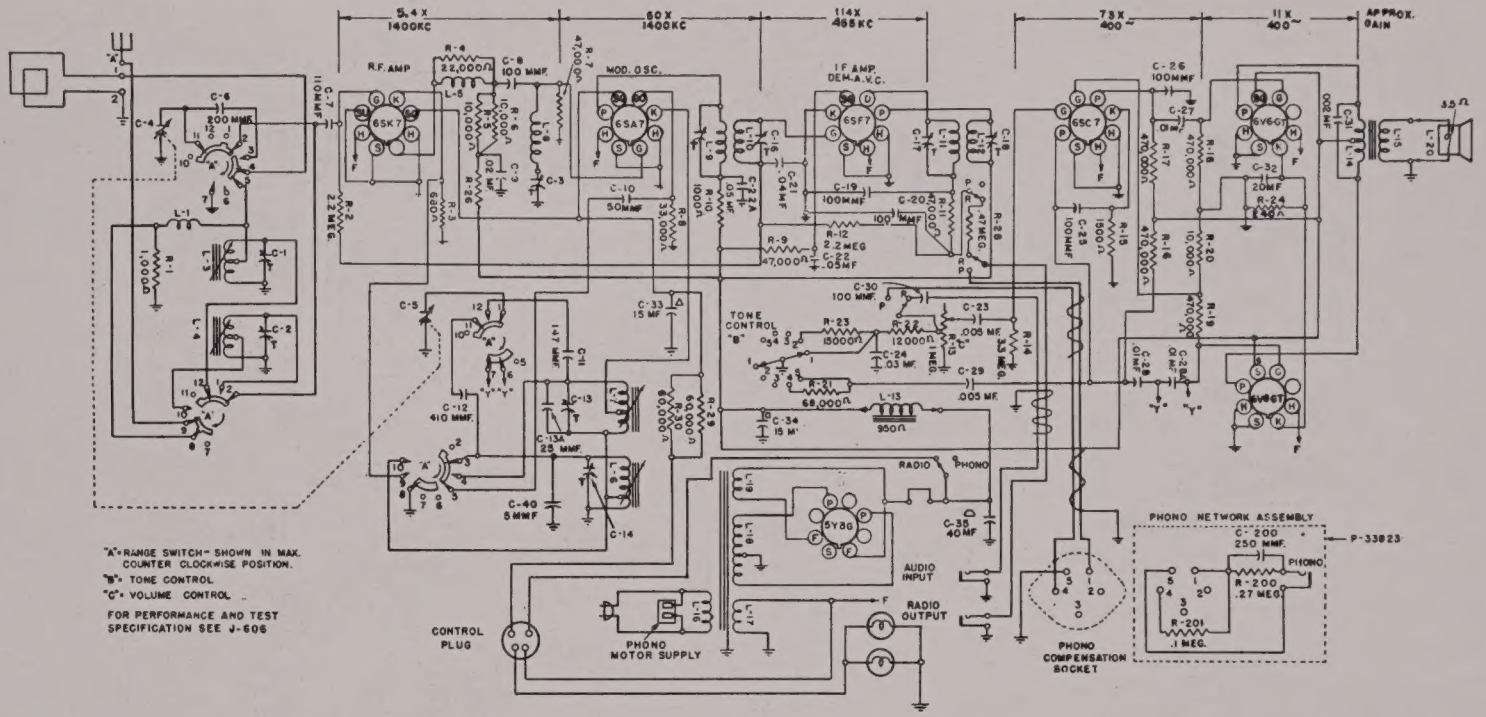
* * *

WESTINGHOUSE Model H-148
Photofact Set No. 15, Folder No. 37

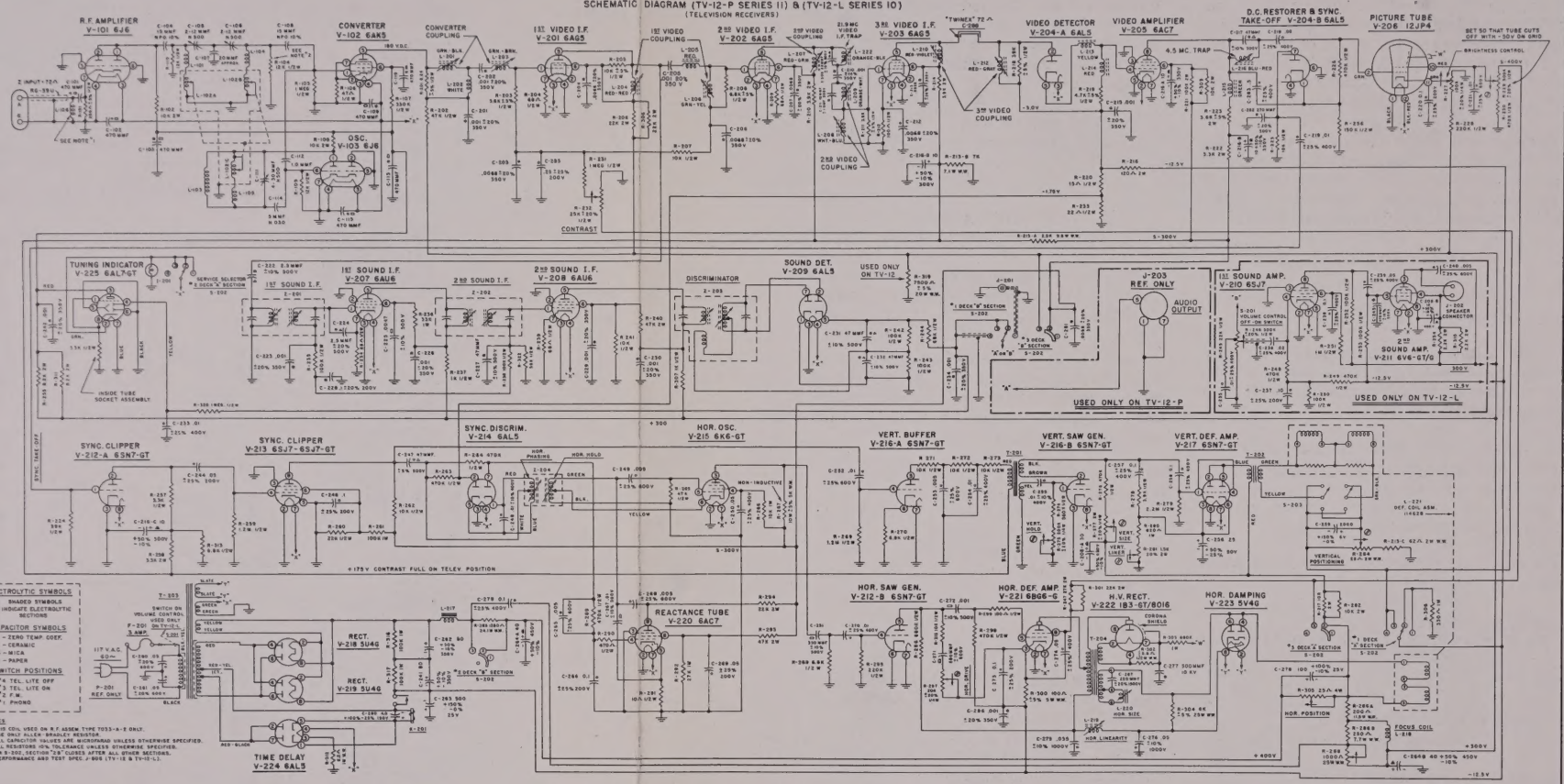
Complaint: When turned on this set would play for about 30 to 45 seconds, then load up and stop as if it had quit oscillating.

Cause and Remedy: B+ would remain steady. Someone had replaced all resistors and condenser in circuit of oscillator. After trying several tubes I replaced Selenium Rectifier and trouble was cured. This makes two jobs on this same model.

Arthur E. Flowers
1601 Rowan Street, Louisville 3, Ky.



STROMBERG CARLSON SERIES TV 12



Note: 1. Terminal 5 of horizontal output transformer T204 returns to +400 volts.
2. R-258 is 33K instead of 3.3K.
3. R-309 is 100K instead of 10K.
4. On recent models the relay contacts of K-201 break the B+ lead instead of the B—. This is between the junction of R-316 and L-217, and the cathodes (pin 8) of V-218 and V-219.

STROMBERG CARLSON
SERIES TV 12

AIRLINE
MODEL 94BR-1533A

AIRLINE
MODEL 94BR-1533A

AIRLINE
MODEL 94BR-1533A

AIRLINE MODEL 94BR-1533A

TRADE NAME	Airline, Model 94BR-1533A		
SUPPLIER	Montgomery Ward and Co., 619 Chicago Ave., Chicago, Illinois		
TYPE SET	AC-DC Operated AM-FM Superheterodyne Receiver with Loop Antenna		
TUBES(SEVEN)	Types 12AT7 FM RF Amp.- Mixer, 12BA7 AM Converter-FM Osc., 12BA6 1st IF Amp., 12AU7 FM 2nd IF Amp., 12AL5 Ratio Det., 12AV6 DET-AVC-AF, 50C5 Power Output		
POWER SUPPLY	105-125 Volts AC-DC	RATING	.34 Amp. at 117 Volts AC
TUNING RANGE-BROADCAST	535-1620KC	FREQ. MOD.	88-108MC

HOWARD W. SAMS & CO., INC. • Indianapolis 1, Indiana

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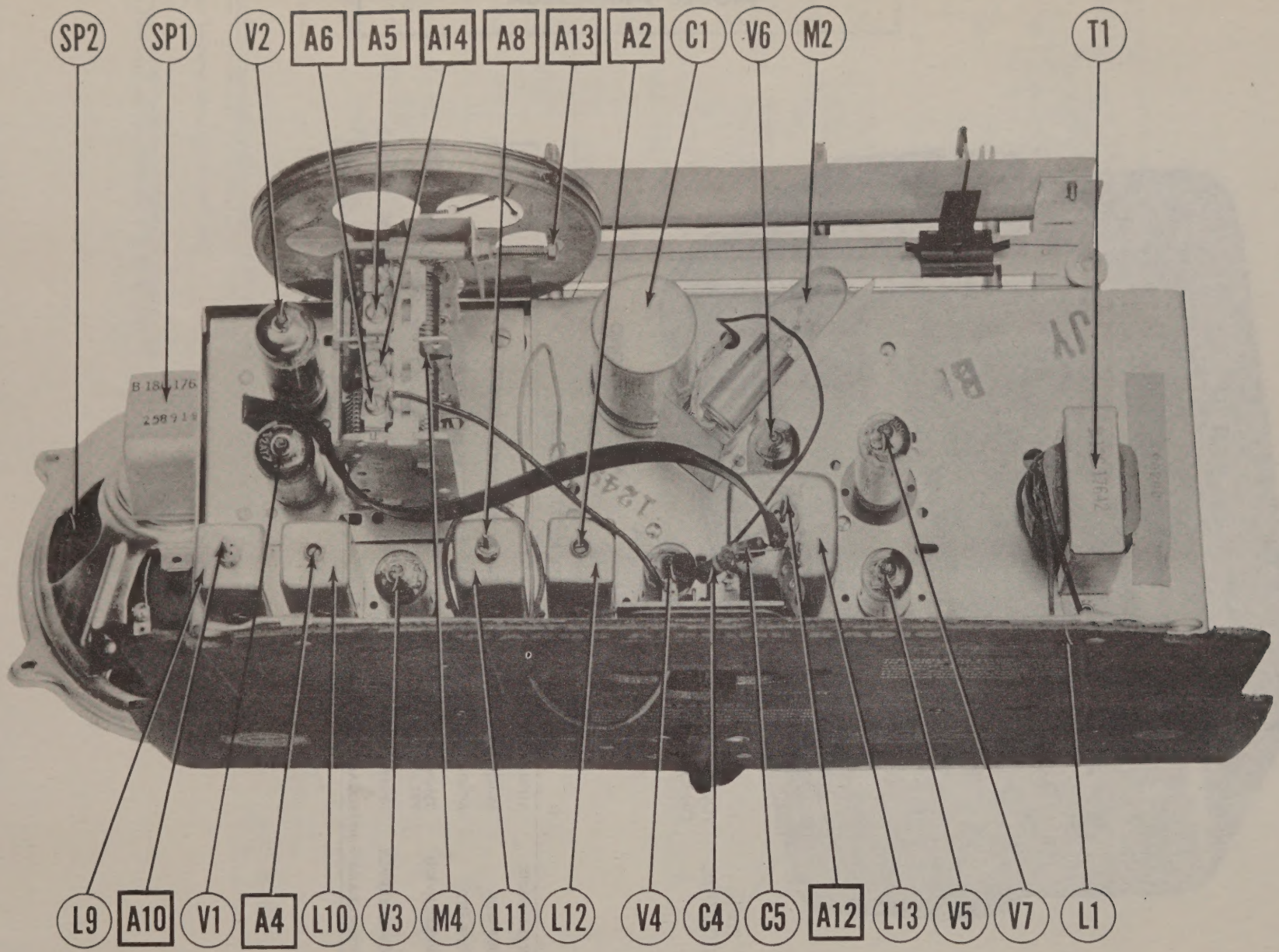
SP2
SP1
V2
A6
A5
A14
A8
A13
A2
C1
V6
M2
T1
L9
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V1
A4
L10
V3
M4
L11
L12
V4
C4
C5
A12
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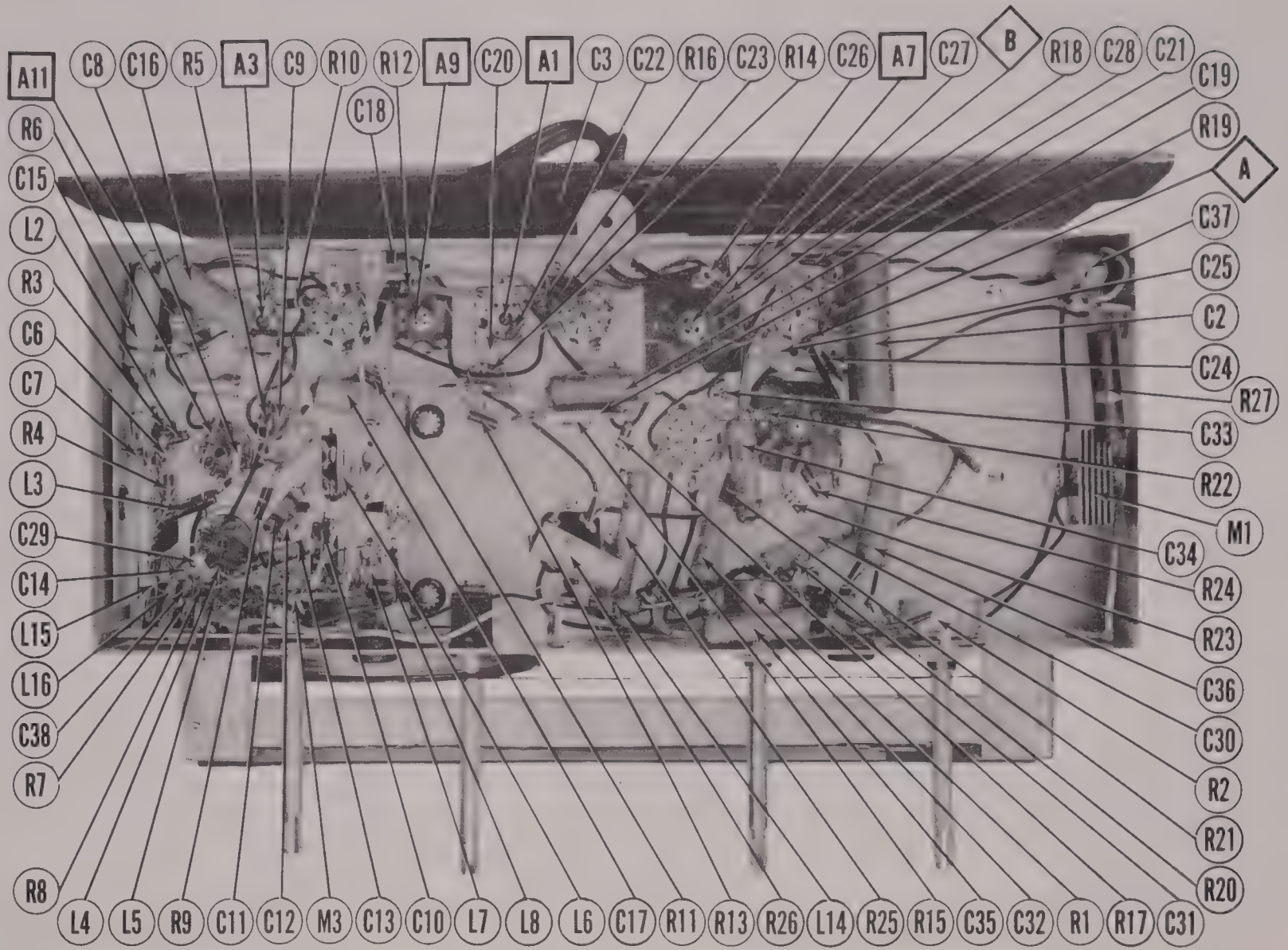
V5
V7
L1


A11
C8
C16
R5
A3
C9
R10
R12
A9
C20
A1
C3
C22
R16
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R14
C26
A7
C27
B
R18
C28
C21
C19
R19
A
C37
C25
C2
C24
R27
C33
R22
M1
C34
R24
R23
C36
C30
R2
R21
R20
C31
R17
R1
C32
C35
R15
R25
L14
R26
R13
R11
C17
L6
L8
L7
C10
C13
M3
C12
C11
R9
L5
L4
R8
R7
C38
L16
L15
C14
C29
L3
R4
C7
C6
R3
L2
C15
R6
C18

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	FM RF Amp.-Mixer	12AT7	12AT7	9A	
V2	AM Converter-FM Oscillator	12BA7	12BA7	8CT	
V3	1st IF Amp.	12BA6	12BA6	7BK	
V4	FM 2nd IF Amp.	12AU6	12AU6	7BK	
V5	Ratio Det.	12AL5	12AL5	6BT	
V6	DET.-AVC-AF	12AV6	12AV6	7BT	
V7	Power Output	50C5	50C5	7CV	

CAPACITORS

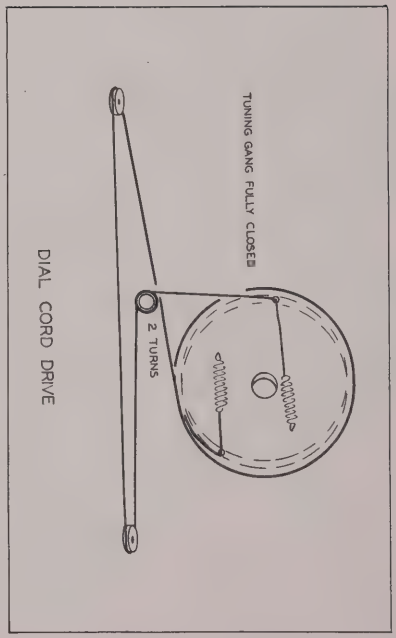
Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	50	150	A-8C-17612	AF101010D4A	UP55515C		EL-452	● Filter
B	50	150		PRS25/25	BR252A		TA-25	■ Filter
C	40	150						▲ Filter
▥	40	25						Output Cathode Bypass
C2	5	100	B-8C-16013	PRS150/4	BR415		UT-41	Stabilizing Cap.
C3	470		C-8G-11732	GP470M	5W5T5	GP2K-470	1FM-35	FM Line Ant. Coupling See Note
C4	470		C-8G-11732	GP470M	5W5T5	GP2K-470	1FM-35	Ant. Coupling
C5	470		C-8G-11732	GP470M	5W5T5	GP2K-470	1FM-35	Ant. Isolation
C6	470		C-8G-11732	GP470M	5W5T5	GP2K-470	1FM-35	FM RF Cathode Bypass
C7	470		C-8G-11732	GP470M	5W5T5	GP2K-470	1FM-35	FM RF Plate Decoupling
C8	100		C-8G-12759	GP100M	5W5T1	GP1K-100	1FM-31	RF Coupling
C9	1000		C-8G-13201	GP1000M	1W5D1	GP2L-001	1FM-21	FM Mixer Cathode Bypass
C10	2.2		A-8G-12495-4					Osc. Coupling
C11	33		C-8G-14172	GP33M	5W5Q4	GP1K-33	1FM-44	RF Coupling
C12	100		C-8G-12759	GP100M	5W5T1	GP1K-100	1FM-31	Osc. Anode Bypass
C13	33		C-8G-14172	GP33M	5W5Q4	GP1K-33	1FM-44	Osc. Grid Cap.
C14	5		C-8G-12166	GP5M	5W5V5	NPOK-5	MS-55	Osc. Cathode Bypass
C15	.01	400	C-8D-10761	P488-01	PTE4S1	821-01	TM-11	Conv. Plate Decoupling
C16	.05	200	C-8D-10770	P288-05	PTE4S5		TM-15	AVC Filter
C17	.01	200	C-8D-11738	P488-01	PTE4S1	821-01	TM-11	1st IF Cathode Bypass
C18	.01	400	C-8D-10761	P488-01	PTE4S1	821-01	TM-11	1st IF Decoupling
C19A	100		A-8F-13127	GP100M	5W5T1	GP1K-100	1FM-31	Diode RF Filter
B	100			GP100M	5W5T1	GP1K-100	1FM-31	Diode RF Filter
C20	100		C-8G-12759	GP100M	5W5T1	GP1K-100	1FM-31	IF Coupling
C21	.003	600	C-8D-11013	P688-003	PTE6D3	GP2M-003	TM-23	2nd IF Decoupling
C22	1							Fixed Trimmer See Note
C23	5000		A-8G-13962	BPD-5	1D5D5	811-005	29C1	2nd IF Filament Bypass
C24	5000		A-8G-13962	BPD-5	1D5D5	811-005	29C1	RF Bypass
C25	390	500	C-8F3-120	1468-0004	5W5T4	GP2K-390	1FM-34	Diode Load Cap.
C26	2000		C-8G-13049	GP2000M	1W5D2	GP2M-002	1FM-22	De-emphasis
C27	.05	200	C-8D-10770	P288-05	PTE4S5		TM-15	Audio Coupling
C28	5000		A-8G-13962	BPD-5	1D5D5	811-005	29C1	FM Det. Filament Bypass
C29	25		C-8G-11784	GP25M	5W5Q25	GP1K-25	MS-425	RF Bypass
C30	.02	200	C-8D-11340	P488-02	PTE4S2		TM-12	Tone Compensation
C31	.05	200	C-8D-10770	P288-05	PTE4S5		TM-15	Isolation
C32	.01	200	C-8D-11738	P488-01	PTE4S1	821-01	TM-11	Audio Coupling
C33	100		C-8G-11734	GP100M	5W5T1	GP1K-100	1FM-31	AF Amp. Plate Bypass
C34	.01	400	C-8D-10761	P488-01	PTE4S1	821-01	TM-11	Audio Coupling
C35	.01	200	C-8D-11738	P488-01	PTE4S1	821-01	TM-11	Tone Compensation
C36	.02	400	C-18D-10774	P488-02	PTE4S2		TM-12	Output Plate Bypass
C37	.05	400	C-8D-10813	P488-05	PTE4S5		TM-15	Line Filter
C38	100		C-8G-11734	GP100M	5W5T1	GP1K-100	1FM-31	Osc. Cathode Bypass

Note. Not used in all models.

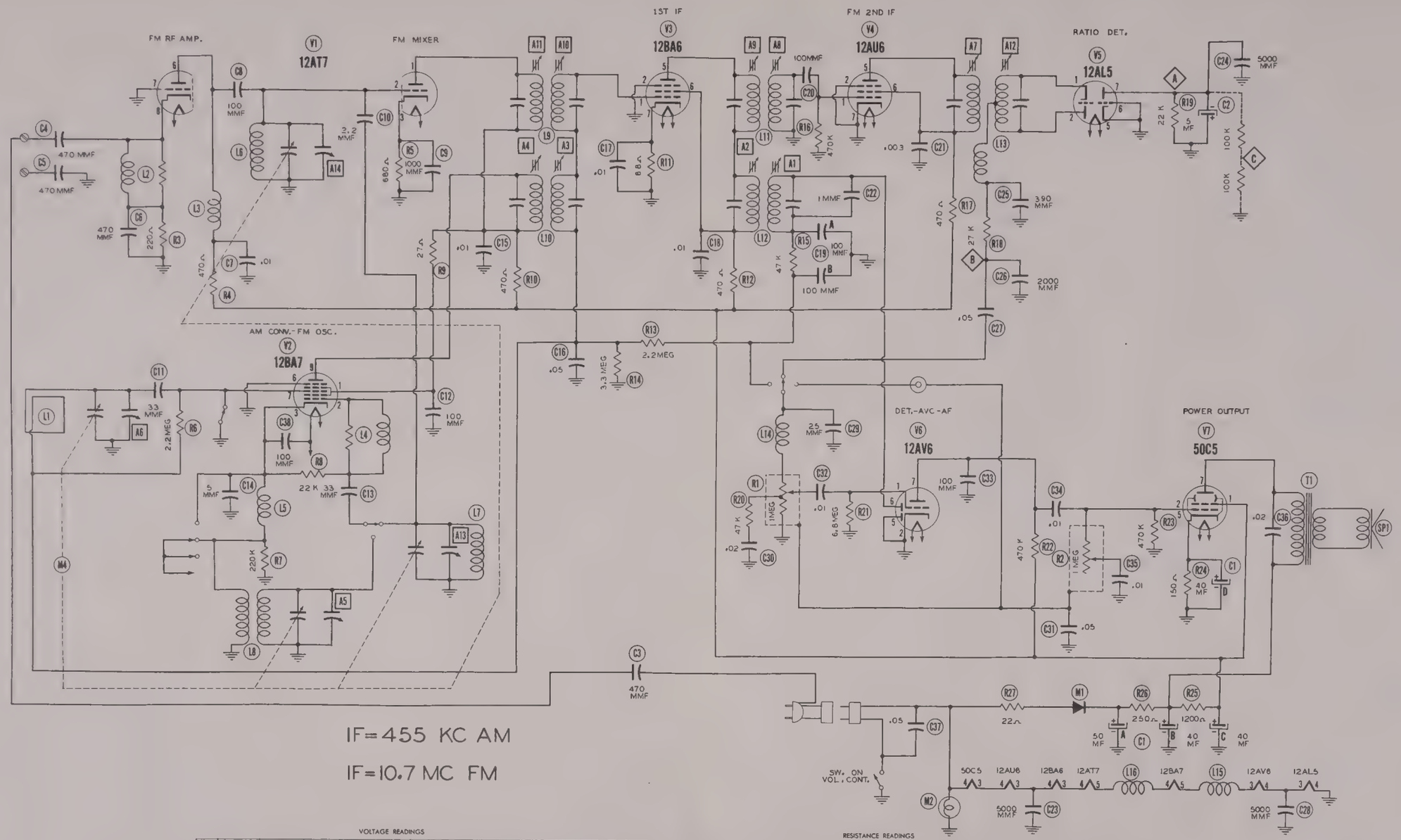
CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: AIRLINE PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	A-10A-17631	Q18-137X	AT-103	Volume control, tapped at 100KΩ
B	Shaft		Not Req.	Not Req.	KSS-3	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SW-A	Attach to R1A per instructions
R2A	1 Meg.	½	A-11B-17632	Q13-137	AM-63-Z	Tone control
B	Shaft		Not Req.	Not Req.	KSS-3	Attach to R2A per instructions



SET 88

FOLDER 1



VOLTAGE READINGS

	Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
†	V1	12AT7	75VDC	0V.	1VDC	47VAC	36VAC	80VDC	0V.	.6VDC	41VAC
	V2A	12BA7	75VDC	8-5VDC	0V.	36VAC	23VAC	0V.	-.5VDC	0V.	75VDC
†	V2B	12BA7	75VDC	8-3.5VDC	0V.	36VAC	23V AC	0V.	0V.	0V.	75VDC
	V3	12BA6	-.1VDC	0V.	47VAC	55VAC	80VDC	80VDC	.4VDC		
†	V4	12AU6	-.5VDC	0V.	55VAC	67VAC	80VDC	80VDC	0V.		
†	V5	12AL5	-.3VDC	-.3VDC	12VAC	0V.	0V.	0V.	-.6VDC		
	V6	12AV6	-.7VDC	0V.	23VAC	12VAC	0V.	-.6VDC	55VDC		
	V7	50C5	5.8VDC	0V.	67VAC	117VAC	0V.	83VDC	113VDC		

§ TAKEN WITH VACUUM TUBE VOLTMETER.
† TAKEN IN FM POSITION.

RESISTANCE READINGS

	Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
†	V1	12AT7	†1.9KΩ	0Ω	[illegible]	29Ω	26Ω	†1.9KΩ	0Ω	220Ω	27Ω
	V2A	12BA7	†1.9KΩ	22KΩ	.8Ω	26Ω	20Ω	0Ω	4.5Meg.	0Ω	†1.9KΩ
†	V2B	12BA7	†1.9KΩ	22KΩ	.8Ω	26Ω	20Ω	0Ω	0Ω	0Ω	†1.9KΩ
	V3	12BA6	1.8Meg.	0Ω	29Ω	31Ω	†1.9KΩ	†1.9KΩ	68Ω		
†	V4	12AU6	470KΩ	0Ω	31Ω	30Ω	†1.9KΩ	†1.9KΩ	0Ω		
†	V5	12AL5	Inf.	Inf.	11Ω	0Ω	0Ω	0Ω	22KΩ		
	V6	12AU6	6.8 Meg.	0Ω	20Ω	11Ω	0Ω	1 Meg.	†470KΩ		
	V7	50C5	150Ω	470KΩ	30Ω	3Ω	470KΩ	†1.5KΩ	†400Ω		

† MEASURED FROM OUTPUT OF M1.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	AIRLINE PART No.	IRC PART No.	
R3	220Ω	½	C-9B1-54		FM RF Cathode
R4	470Ω	½	C-9B1-58	BTS-470	FM RF Plate Decoupling
R5	680Ω	½	C-9B1-60	BTS-680	FM Mixer Cathode
R6	2.2 Meg.	½	C-9B1-33	BTS-2.2 Meg.	AM Conv. Grid
R7	220KΩ	½	C-9B1-27	BTS-220K	AM Osc. Coil Shunt
R8	22KΩ	½	C-9B1-78	BTS-22K	Osc. Grid
R9	27Ω	½	C-9B1-43		Parasitic Supp.
R10	470Ω	½	C-9B1-58	BTS-470	Conv. Decoupling
R11	68Ω	½	C-9B1-48		1st IF Cathode
R12	470Ω	½	C-9B1-58	BTS-470	1st IF Decoupling
R13	2.2 Meg.	½	C-9B1-33	BTS-2.2 Meg.	AVC Network
R14	3.3 Meg.	½	C-9B1-34	BTS-3.3 Meg.	AVC Network
R15	47KΩ	½	C-9B1-82	BTS-47K	Diode Filter
R16	470KΩ	½	C-9B1-94	BTS-470K	2nd FM IF Grid
R17	470Ω	½	C-9B1-58	BTS-470	2nd FM IF Decoupling
R18	27KΩ	½	C-9B1-79	BTS-27K	De-emphasis
R19	22KΩ	½	C-9B1-78	BTS-22K	Ratio Det. Diode Load
R20	47KΩ	½	C-9B1-82	BTS-47K	Tone Compensation
R21	6.8 Meg.	½	C-9B1-36	BTS-6.8 Meg.	AF Grid
R22	470KΩ	½	C-9B1-94	BTS-470K	AF Plate
R23	470KΩ	½	C-9B1-84	BTS-470K	Output Grid
R24	150Ω	½	C-9B1-52	BW-½-150	Output Cathode
R25	1200Ω	2	C-9B4-63	BW-2-1200	Filter
R26	250Ω	5		AB-250	Filter-Wire Wound-See Note
R27	22Ω	2	C-9B4-42		Surge Limiter

Note. Some models use 270Ω, 2 watt resistor in this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AIRLINE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2.3KΩ	3.4Ω	140Ω	.5Ω	B-12C-17642	A-3876 *	A-2928 *	RO-2 *	* Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			AIRLINE PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V. C. IMP.				
SP1	PM	3.4Ω	B-18A-17637		57A1	
	CONE DIA.	V. C. DIA.				
SP2	4 3/4" x 7"	9/16"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA	
		PRI.	SEC.	AIRLINE PART No.	MEISSNER PART No.
L1	AM Loop Ant.	1.2Ω		C-13E-17649	
L2	Parasitic Supp.	0Ω		A-16B-16616	
L3	RF Choke	1.6Ω		A-16B-16613	
L4	Parasitic Supp.	0Ω		A-16B-16615	
L5	RF Choke	.5Ω		A-16B-16023	
L6	FM RF Coil	0Ω		A-13E-16618	
L7	FM Osc. Coil	0Ω		A-13D-16617	
L8	AM Osc. Coil	.8Ω	5Ω	B-13D-16611	14-1073
L9	FM 1st IF	.8Ω	.1Ω	B-13A-16612	
L10	AM 1st IF	14Ω	14Ω	B-13A-16662	16-6878
L11	FM 2nd IF	1Ω	1.2Ω	B-13B-16000	
L12	AM 2nd IF	14Ω	14Ω	B-13B-16302	16-6878
L13	Ratio Det. Trans.	1Ω	.2Ω	B-13M-16001	
L14	RF Choke	2.2Ω		A-16A-16637	
L15	Fil. Choke	.5Ω		A-16B-16623	
L16	Fil. Choke	.5Ω		A-16B-16023	

PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	AIRLINE PART No.	SYLVANIA PART No.		
M1	.061A	A-21J-12775	NC-5		

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					AIRLINE PART No.		
M2	Bayonet	117			A-46A-16545		Type 10W 105-125V

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M3	Switch	B-20A-17633	Band
M4	2 Gang Var. Cap.	B-8A-17673	(27-478MMF, 32-208MMF)
A13	Trimmer	A-20I-15142	FM Osc. Adj.
	Dial Pointer	B-2G-17624	
	Dial Scale	C-6D-17629	
	Cabinet	5C-17654-36	
	Knob	B-5B-11131-41	Plain
	Knob	B-5B-16057-41	With dot

CROMWELL, PLYMOUTH, STARK
MODEL 1010

CROMWELL, PLYMOUTH, STARK
MODEL 1010

STARK MODEL 1010

TRADE NAME	Cromwell, Plymouth, Stark, Model 1010
MANUFACTURER	Stark Sound Engineering, 2131 Fairfield Ave., Fort Wayne 6, Indiana
SUPPLIERS	Cromwell-Mercantile Stores Co., Inc., 128 West 31st St., New York, New York
	Plymouth-Interstate Stores Buying Corp., 111 8th Ave., New York 11, New York
TYPE SET	AC-DC Operated Superheterodyne Receiver
TUBES(FOUR)	Types 12BE6 Converter, 12AT6 DET-AVC-AF, 50C5 Power Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC RATING .25 Amp. at 117 Volts AC
TUNING RANGE—BROADCAST	545-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and chassis.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.02MFD	High side to stator on rear section on tuning gang. Low side to chassis.	455KC (400 ~ Mod.)	Tuning gang fully closed	Across voice coil.	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	50MMF	High side to antenna terminal on antenna coil. (Remove hank. antenna). Low side to chassis.	545KC	"	"	A3	Adjust for maximum output.
3.	50MMF	"	1400KC	Tune for max. output	"	A4	"

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: STARK PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	DET.-AVC-AF	12AT6	12AT6	7BT	
V3	Power Output	50C5	50C5	7CV	
V4	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: STARK PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	150	31E003	PRS150/40-20	EDL4215		TA-240	Filter Red
B	20	150						Filter Bare
C2	.001	600		P688-001	PTE6D1	GP2L-001	TM-21	Antenna Coupling
C3	01	200		P488-01	PTE4S1	821-01	TM-11	AVC Filter
C4	100	500		1468-0001	5W5T1	GP1K-100	1FM-31	Diode RF Filter
C5	.002	600		P688-002	PTE6D2	GP2M-002	TM-22	Audio Coupling
C6	.005	600		P688-005	PTE6D5	811-005	TM-25	Audio Coupling
C7	.03	200		P488-03	PTE6S3		TM-13	Output Plate Bypass
C8	.006	600		P688-006	PTE6D6	GP2M-0056	TM-26	Line Filter

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: STARK PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	500KΩ	½	26G008	Q13-133	AM-60-Z	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SW-A	Attach to R1A per instructions

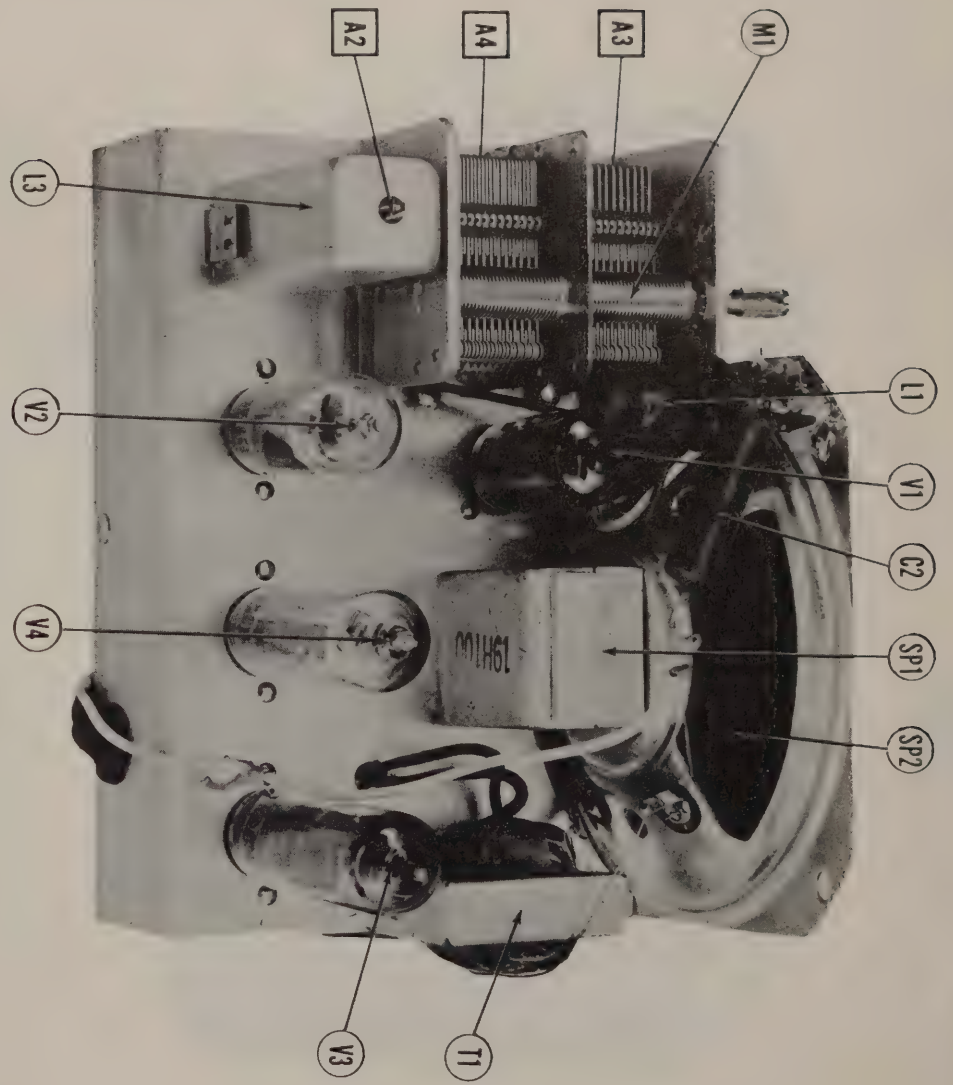
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: STARK PART No.	IRC PART No.	IDENTIFICATION CODES
R2	2 Meg.	½		BTS-2.2 Meg.	AVC Network
R3	22KΩ	½		BTS-22K	Osc. Grid
R4	4.7 Meg.	½		BTS-4.7 Meg.	AF Grid
R5	100KΩ	½		BTS-100K	AF Plate
R6	500KΩ	½		BTS-470K	Output Grid
R7	150Ω	1		BW-1-150	Output Cathode
R8	2000Ω	1		BW-1-2200	Filter
R9	33Ω	1			Rect. Ballast
R10	65Ω	5			Filament Dropping-Wire Wound

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: STARK PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	2KΩ	3.2Ω	178Ω	.5Ω	15D001	A-3332	A-3025	RO-2 *	* Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: STARK PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.		ST-113		
SP1	PM	3.2Ω	19H100	MOD. P4-X	4A07	
	CONE DIA.	V. C. DIA.				
SP2	3 7/8"	9/16"				

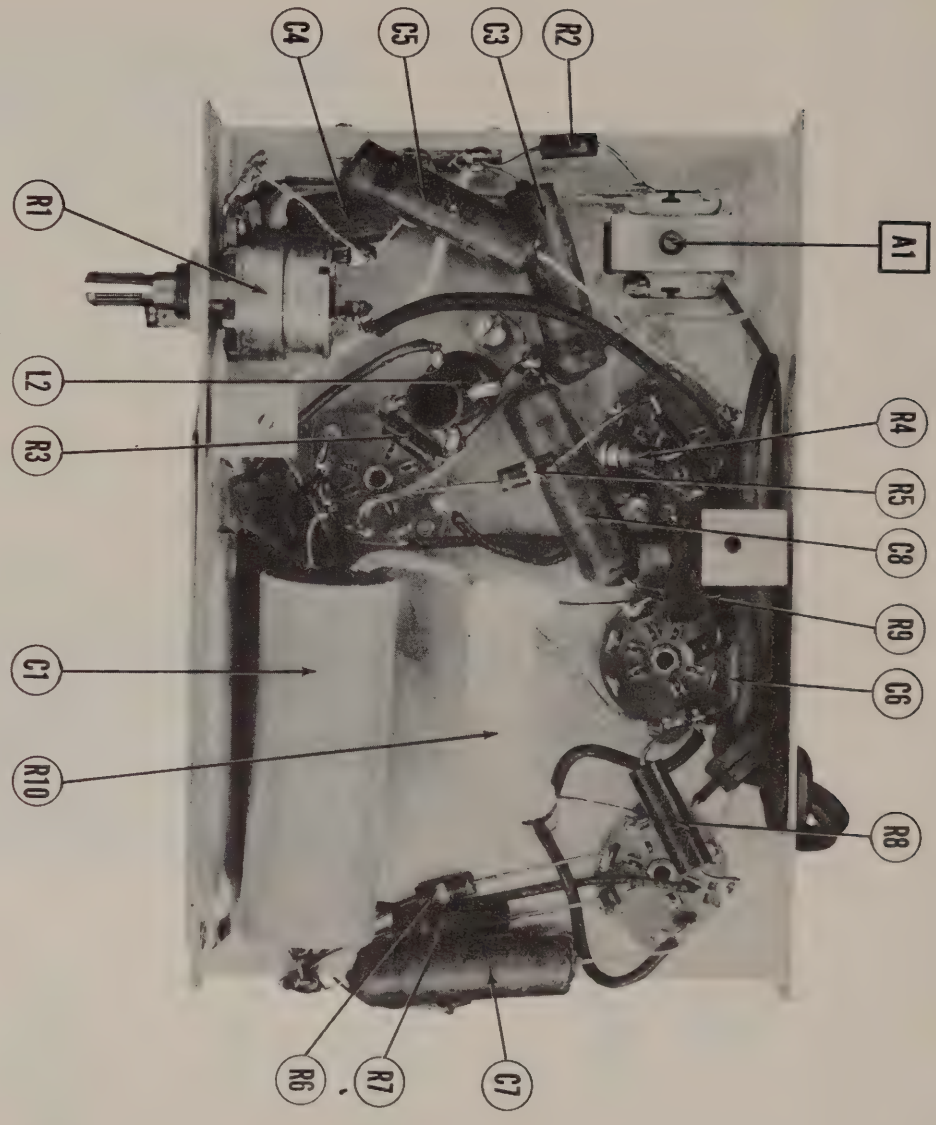
R F COILS

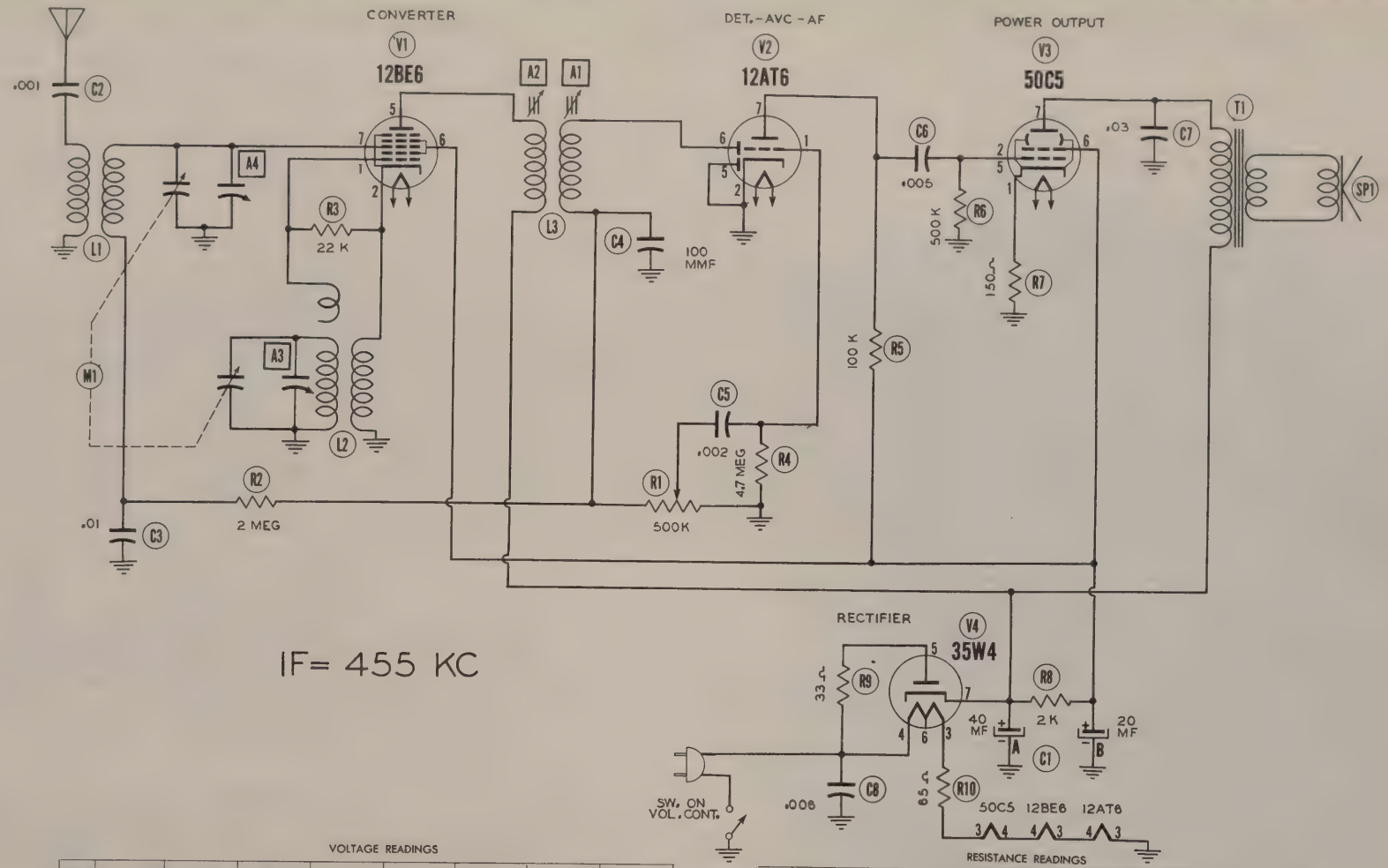
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: STARK PART No.	REPLACEMENT DATA: MEISSNER PART No.
L1	Ant. Coil	42Ω	3Ω	35D004	14-1071
L2	Osc. Coil	1Ω	8.5Ω	35C002	14-1073
L3	IF Trans.	23Ω	25Ω	18A005	16-6678

MISCELLANEOUS

ITEM No.	PART NAME	STARK PART No.	NOTES
M1	2 Gang Var. Cap.	29A002	(40-409MMF, 28-218MMF)
	Cabinet	40B011	Walnut
	Cabinet	40B010	Ivory
	Knob	5D004	Pointer, Walnut
	Knob	5D005	Pointer, Ivory
	Knob	5D006	Walnut
	Knob	5D007	Ivory

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	§-7.2VDC	0V.	12VAC	25VAC	130VDC	107VDC	-.1VDC
V 2	12AT6	-.3VDC	0V.	0V.	12VAC	0V.	-.6VDC	70VDC
V 3	50C5	6.5VDC	0V.	75VAC	25VAC	0V.	107VDC	120VDC
V 4	35W4	0V.	0V.	82VAC	117VAC	115VAC	110VAC	130VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	1Ω	12Ω	24Ω	†23Ω	†2KΩ	2.5 Meg.
V 2	12AT6	4.7 Meg.	0Ω	0Ω	12Ω	0Ω	500KΩ	†100KΩ
V 3	50C5	150Ω	500KΩ	75Ω	24Ω	500KΩ	†2KΩ	†170Ω
V 4	35W4	Inf.	Inf.	130Ω	165Ω	200Ω	160Ω	150KΩ

† MEASURED FROM PIN 7 OF V4.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

DELCO MODEL TV102

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DELCO MODEL TV102

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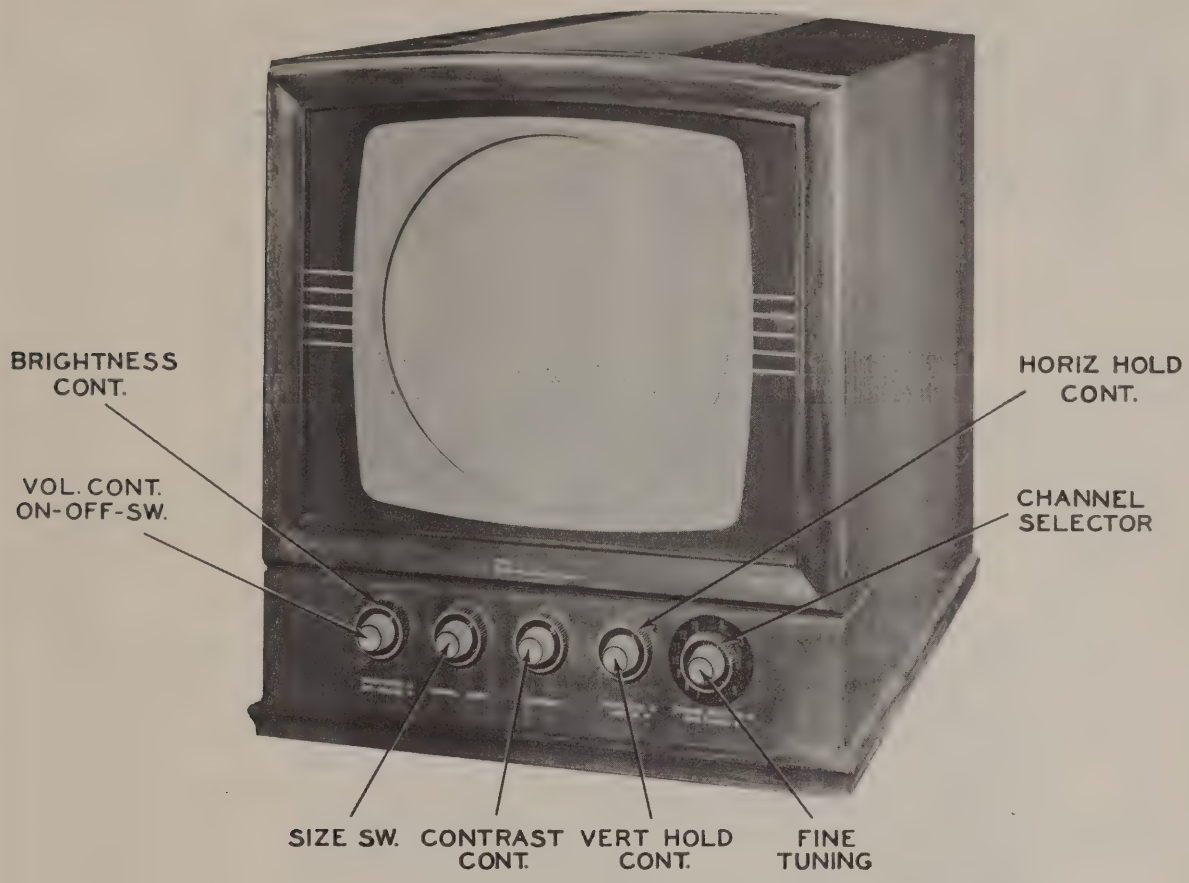
Date 3/50 Set No. 88—Folder No. 3



DELCO
MODEL TV-102

DELCO MODEL TV-102

TRADE NAME	Delco Model TV-102
SUPPLIER	United Motors Service, Div. of GMC, General Motor Bldg., Detroit 2, Mich.
TYPE SET	Television Receiver
TUBES	Twenty Three
POWER SUPPLY	110-120 Volts AC-60 Cycle — RATING 2.1 Amp. at 117 Volts AC
TUNING RANGE	Channels 2 thru 13

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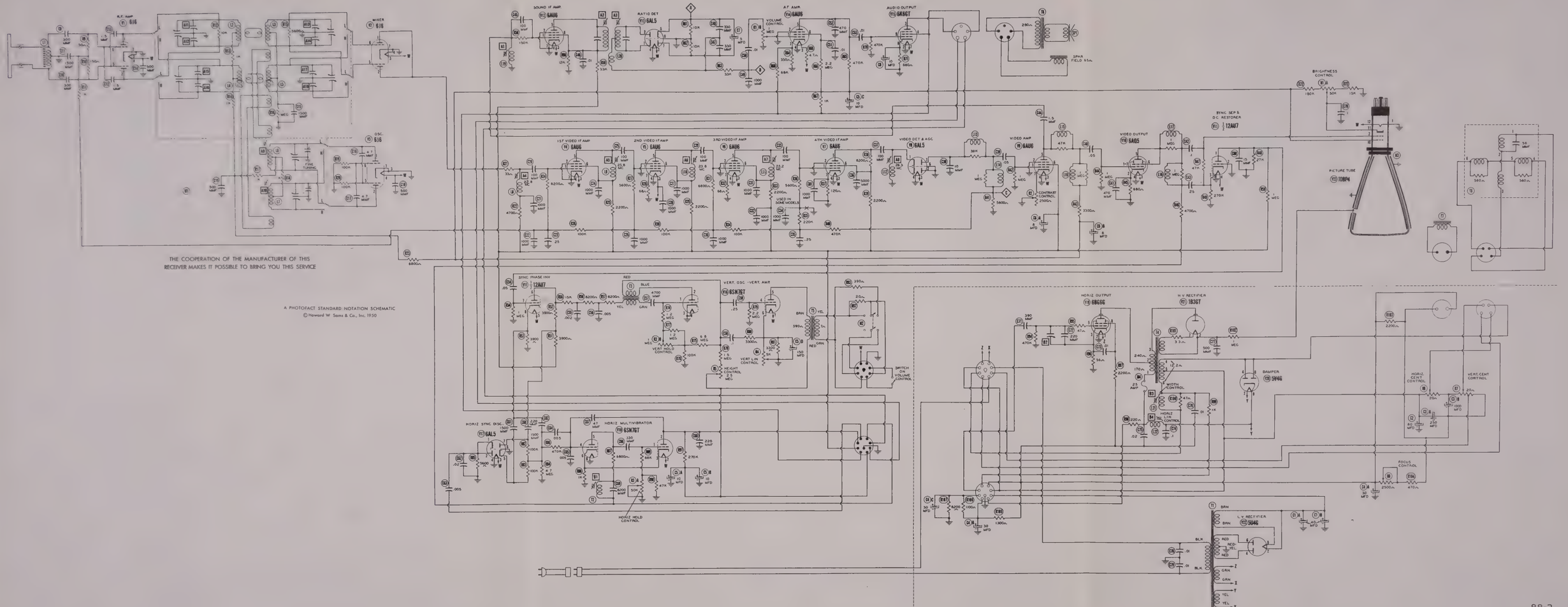

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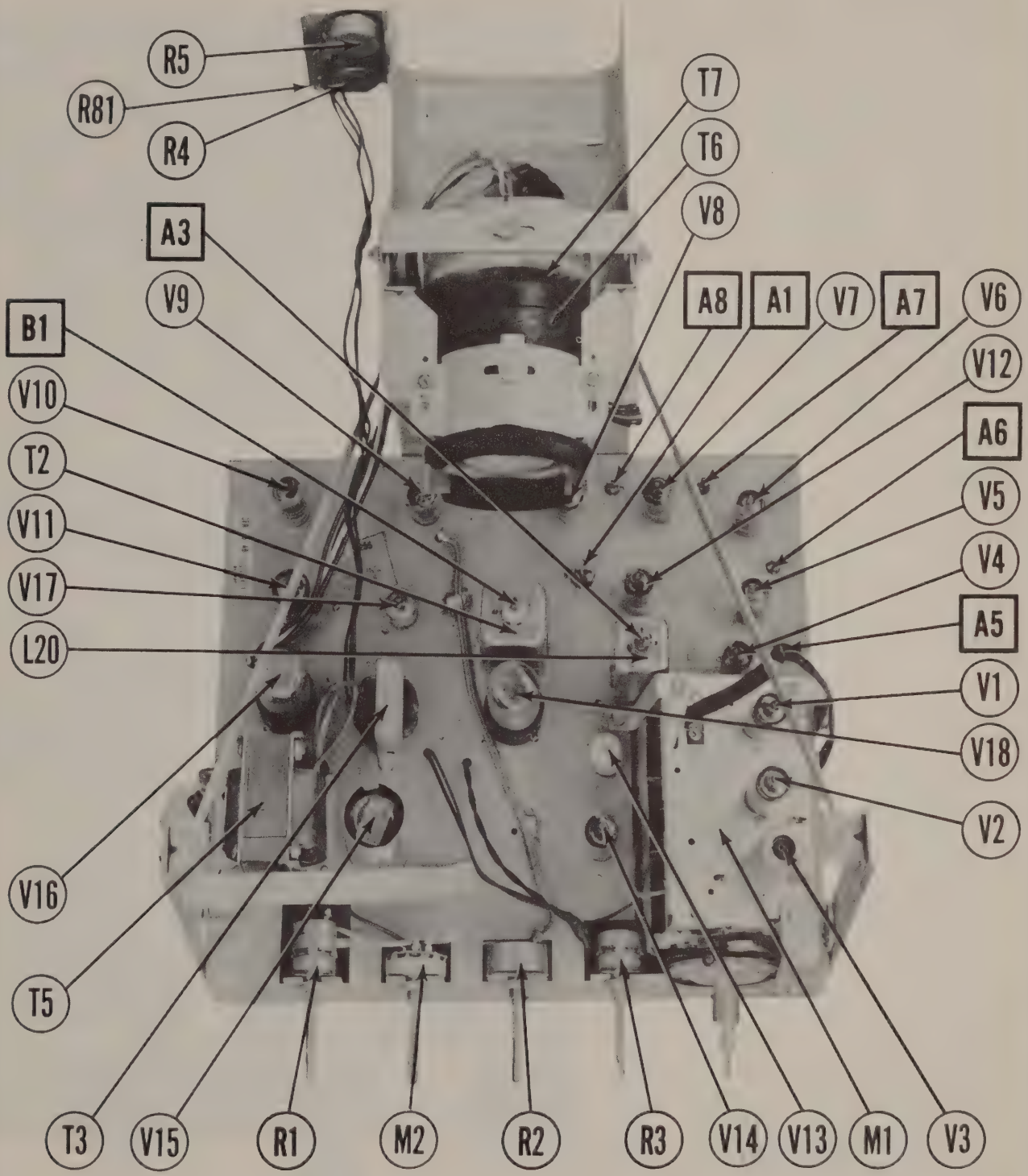
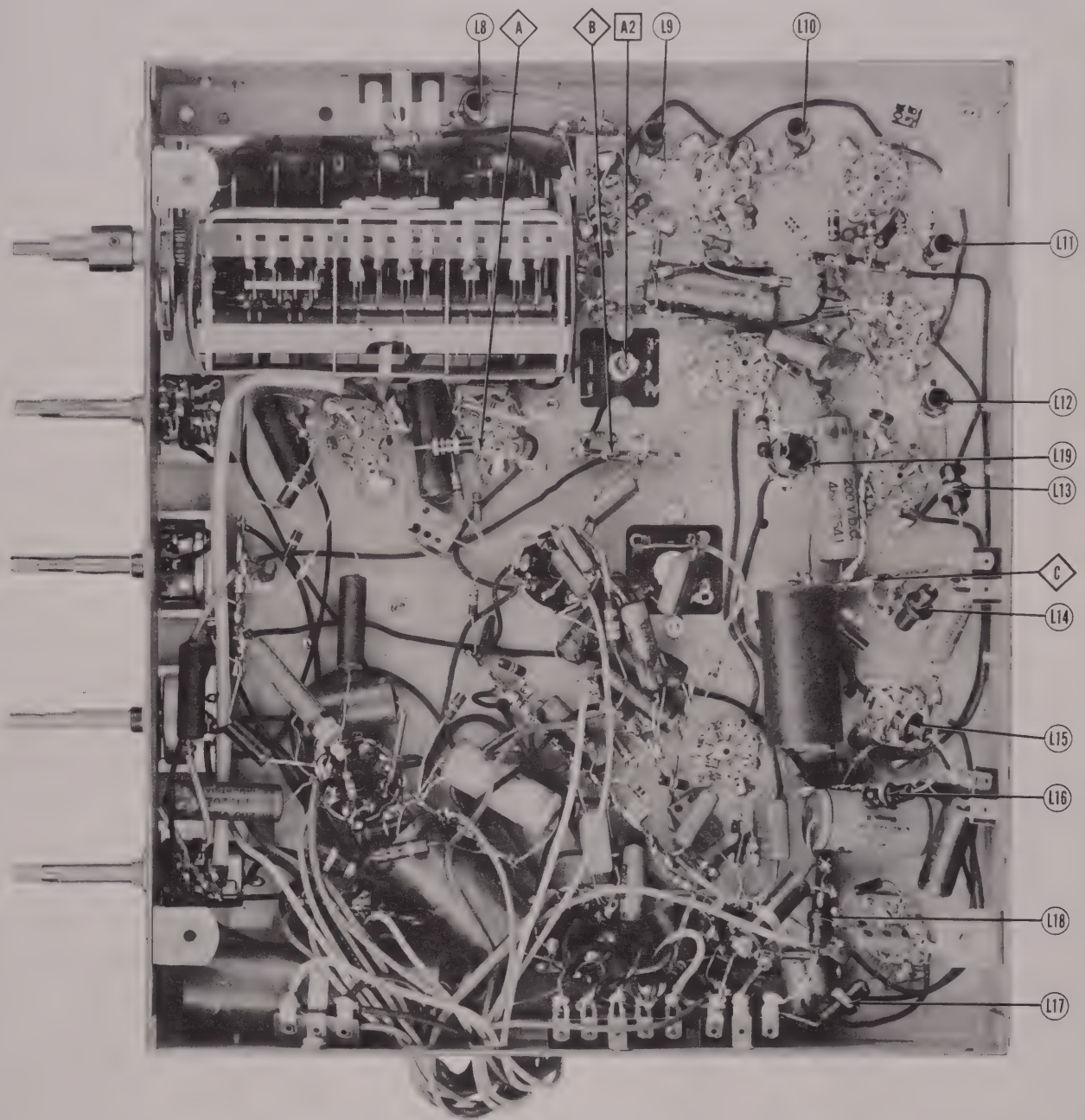
DELCO
MODEL TV-102

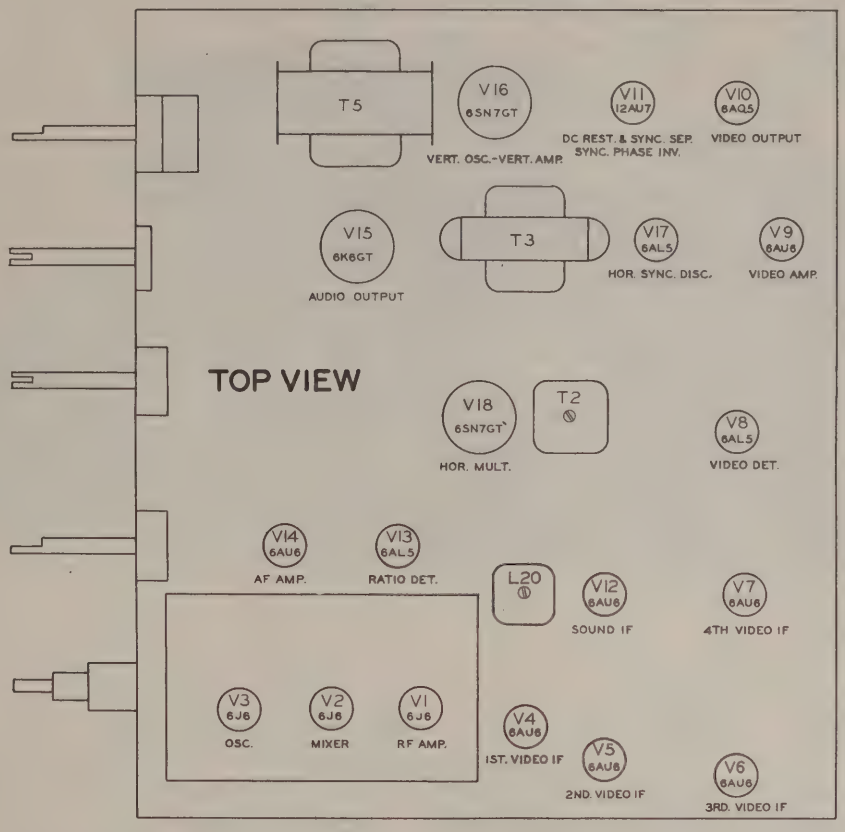
88-3

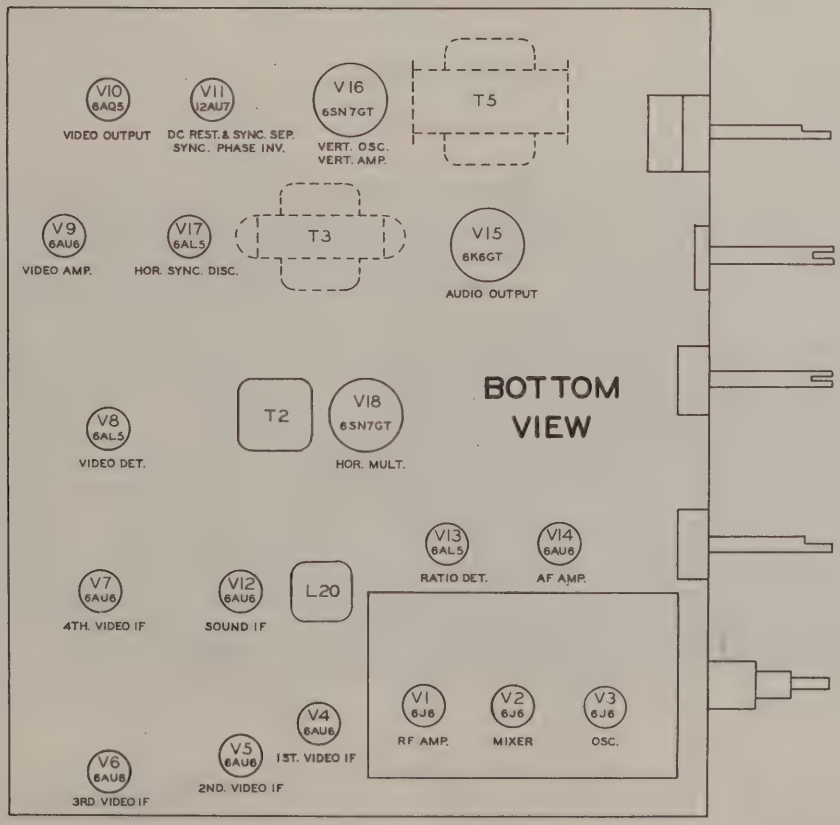


CHASSIS -TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube (V18) from its socket.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to pin 1 (Grid) of 6AU6 (V9). Low side to chassis.	4.5MC (Unmod.)	Any channel not used locally	DC Probe to Point (A) Common to chassis.	A1, A2	Adjust for maximum deflection.
2.	.01MFD	"	"	"	DC Probe to Point (B) Common to chassis.	A3	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ~ modulation and 450KC sweep. Use 120 ~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.01MFD	High side to pin 1 (Grid) of 6AU6 (V9). Low side to chassis.	4.5MC (450KC Sweep)	4.5MC	Any channel not used locally	Vert. Amp. to Point (A) Low side to chassis.	A1, A2	Disconnect stabilizer capacitor C7. Adjust for maximum amplitude and symmetry as per Fig 1.
2.	.01MFD	"	"	"	"	Vert. Amp. to Point (B) Common to chassis.	A3, A2	Reconnect capacitor C7. Adjust A3 so 4.5MC occurs at center of crossover lines as per Fig 2. Slightly retouch A2 for maximum amplitude and straightness of crossover lines.

VIDEO IF ALIGNMENT

Remove the local oscillator tube (V3) to prevent erroneous indicationss

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
3.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	22.8MC (Unmod.)	Any	DC Probe to Point (C) Low side to chassis.	A4	Adjust for maximum deflection.
4.	Direct	"	25.8MC	"	"	A5	"
5.	Direct	"	23.8MC 25.2MC	"	"	A6 A7	"
6.	Direct	"	26.3MC	"	"	A8	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	24MC (10MC Sweep)	21.75MC 26.25MC	Any	Vert. Amp. to Point (C) Low side to chassis.		Check for response curve similar to Fig 3 with markers as shown. If necessary retouch A4 thru A8 for proper response.

OSCILLATOR ALIGNMENT

Replace the local oscillator tube.
Connect a .01MFD capacitor between pin 2 of the picture tube, (V23), socket and pin 1 of the first audio amplifier tube (V14) socket.
Connect the BFO generator high side to an ungrounded tube shield slipped over the video detector tube (V8). Connect the low side to chassis.
Set the fine tuning control to the mid-position of its range.
The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BFO GEN. FREQ.	CHANNEL	ADJUST	REMARKS
8.	Two 150Ω carbon res.	Across antenna terminals with 150Ω in each lead.	57MC (Unmod.)	24.5MC (Unmod.)	2	A9	Adjust for a rough audio beat note using the speaker as an indicator.
9.	"	"	177MC (Unmod.)	"	7	A10	"

RF AND MIXER ALIGNMENT

The RF and mixer circuits in this receiver are normally very stable and should not require adjustment in the field.
Alignment of these circuits should not be attempted unless they are definitely known to be out of alignment.
The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	Two 150Ω carbon res.	Across antenna terminals with 150Ω in each lead.	85MC (Unmod.)	6	DC Probe to Point (C) Common to chassis.	A11, A12, A13, A14	Adjust for maximum deflection. Keep trimmer pairs at approximately the same relative position.
11.	"	"	213MC (Unmod.)	13	"	A15, A16, A17, A18	"

FIG. 1

FIG. 2

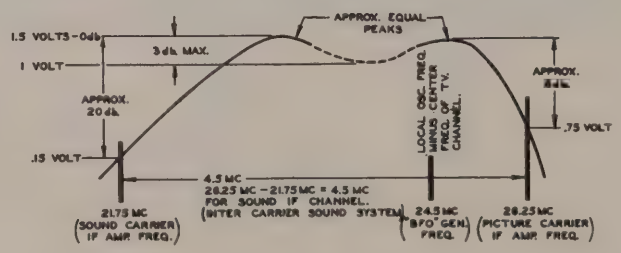
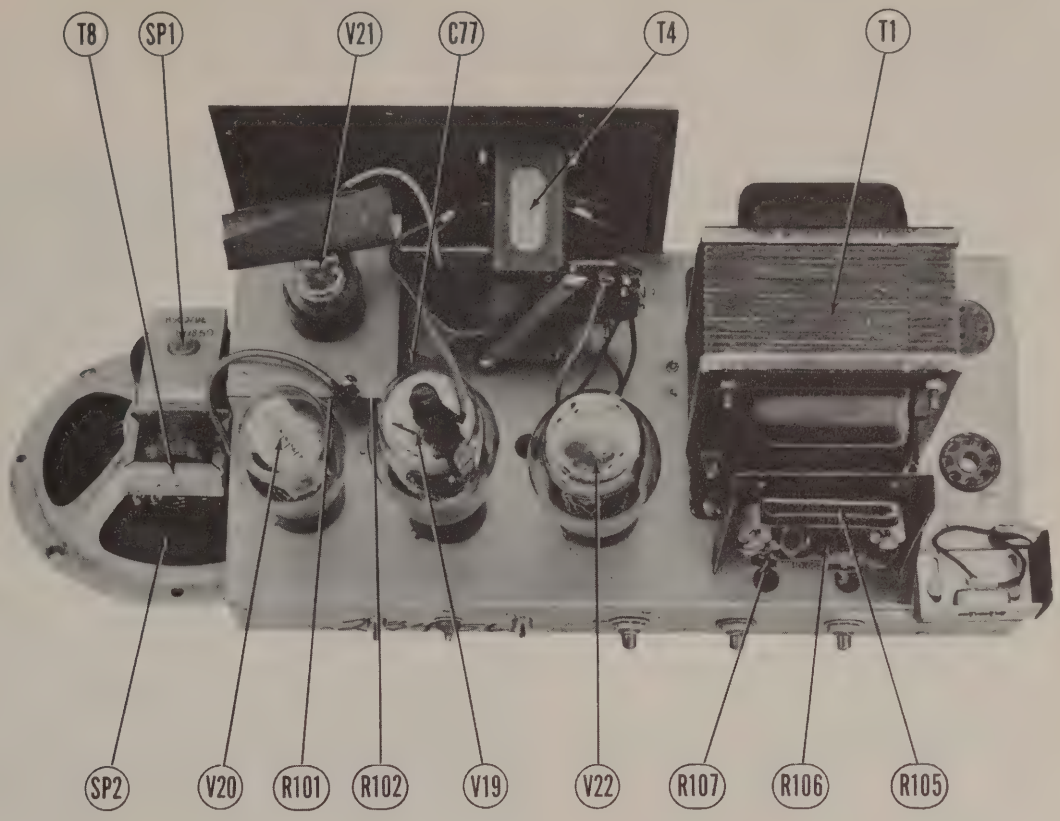
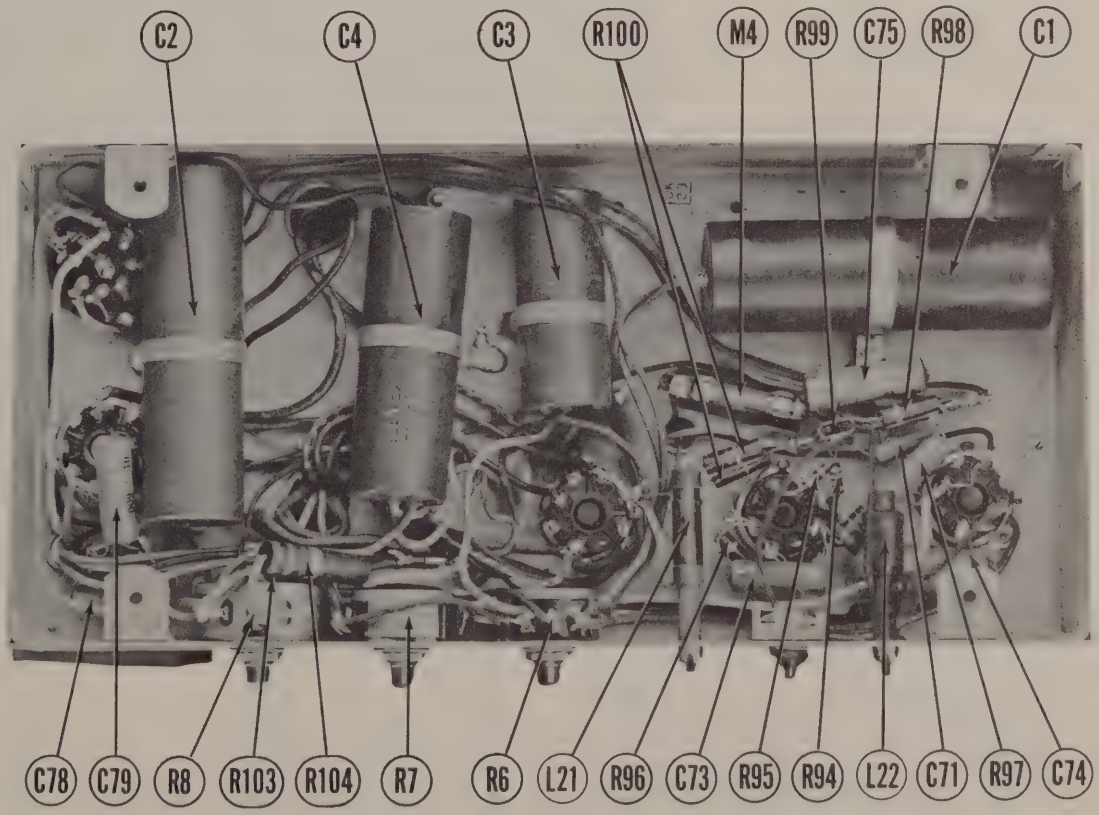


FIG. 3



POWER SUPPLY CHASSIS-TOP VIEW



POWER SUPPLY CHASSIS-BOTTOM VIEW

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	65VDC	65VDC	0V.	6.3VAC	-.5VDC	-.5VDC	0V.		
V 2	6J6	100VDC	100VDC	6.3VAC	0V.	-1.4VDC	-1.4VDC	0V.		
V 3	6J6	55VDC	55VDC	0V.	6.3VAC	§-1.3VDC	§-1.2VDC	0V.		
V 4	6AU6	-1.6VDC	0V.	6.3VAC	0V.	120VDC	120VDC	0V.		
V 5	6AU6	-.5VDC	0V.	6.3VAC	0V.	120VDC	120VDC	.5VDC		
V 6	6AU6	-.5VDC	0V.	6.3VAC	0V.	120VDC	120VDC	.5VDC		
V 7	6AU6	0V.	0V.	6.3VAC	0V.	85VDC	120VDC	1VDC		
V 8	6AL5	0V.	0V.	6.3VAC	0V.	0V.	0V.	-.1VDC		
V 9	6AU6	0V.	0V.	6.3VAC	0V.	185VDC	137VDC	3.2VDC		
V 10	6AQ5	0V.	15VDC	6.3VAC	0V.	235VDC	235VDC	0V.		
V 11	12AU7	3.8VDC	0V.	1.1VDC	6.3VAC	6.3VAC	125VDC	0V.	6.2VDC	0V.
V 12	6AU6	-.4VDC	0V.	6.3VAC	0V.	28VDC	28VDC	0V.		
V 13	6AL5	-.2VDC	.2VDC	6.3VAC	0V.	.4VDC	0V.	-.5VDC		
V 14	6AU6	0V.	0V.	5VAC	0V.	90VDC	32VDC	1.1VDC		
V 15	6K6GT	0V.	0V.	195VDC	200VDC	0V.	87VDC	6.3VAC	13.5VDC	
V 16	6SN7GT	-6VDC	50VDC 120VDC	0V.	0V.	450VDC	20VDC .2VDC	6.3VAC	0V.	
V 17	6AL5	.1VDC	.1VDC	6.3VAC	0V.	3.2VDC	0V.	-.8VDC		
V 18	6SN7GT	-7.8VDC	115VDC	11VDC	.4VDC	290VDC	11VDC	6.3VAC	0V.	
V 19	6BG6G	0V.	0V.	5.4VDC	0V.	-10VDC	0V.	6.3VAC	320VDC	TOP CAP *
V 20	5V4G	0V.	480VDC	0V.	400VDC	0V.	400VDC	0V.	480VDC	
V 21	1B3GT	* DO NOT MEASURE.								
V 22	5U4G	0V.	420VDC	0V.	380VAC	0V.	380VAC	400VDC	420VDC	
V 23	10BP4	0V.	.8VDC	PIN 10 185VDC	PIN 11 38VDC	PIN 12 6.3VAC				

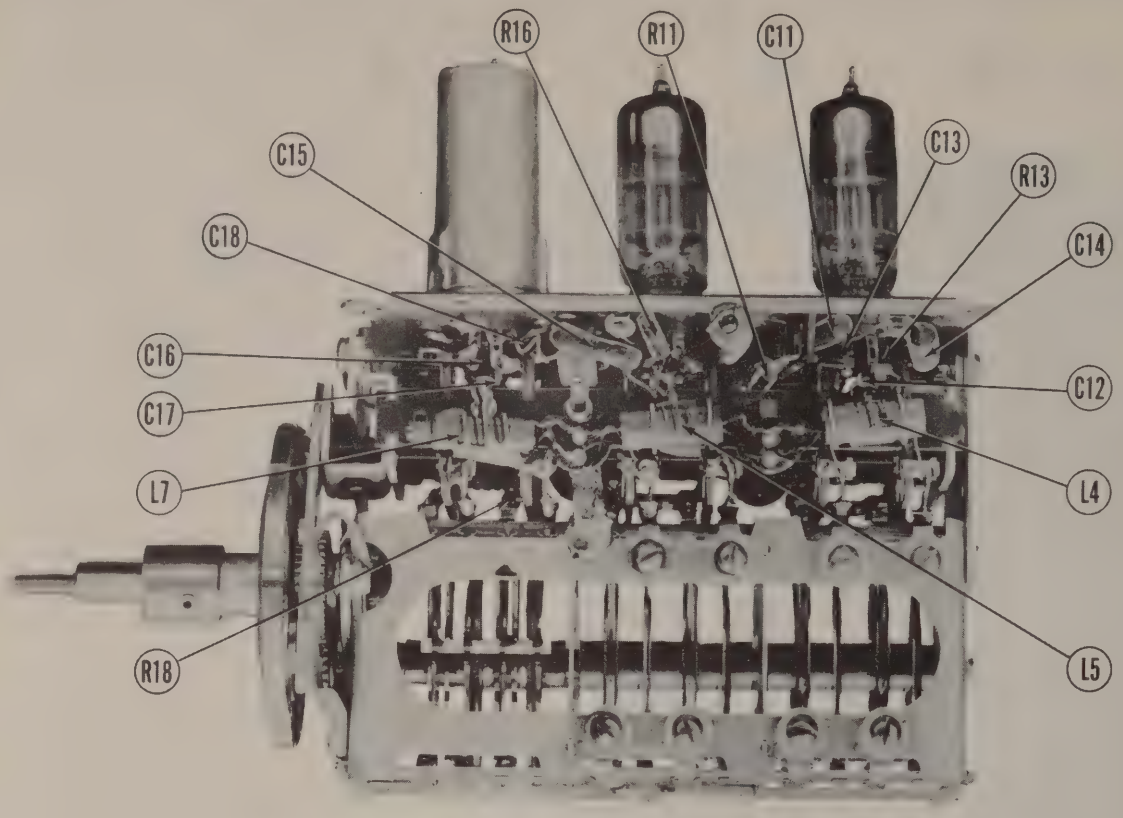
§ TAKEN WITH VACUUM TUBE VOLTMETER.
* DO NOT MEASURE.

RESISTANCE READINGS

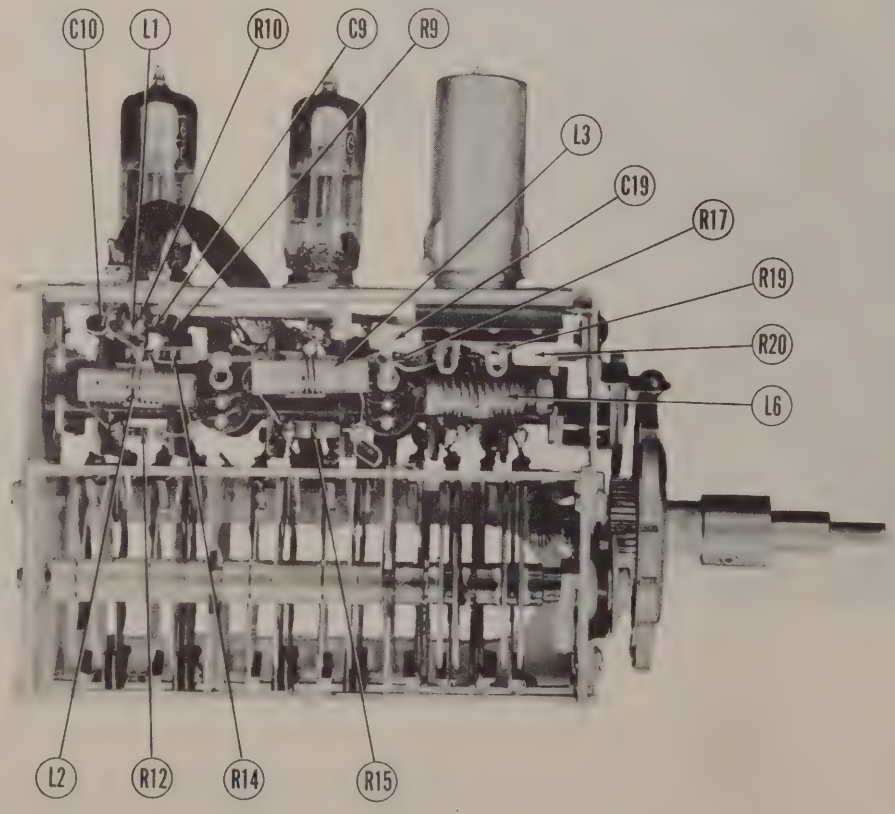
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	†11KΩ	†11KΩ	0Ω	.1Ω	770KΩ	770KΩ	0Ω		
V 2	6J6	†9KΩ	†9KΩ	.1Ω	0Ω	1 Meg.	1 Meg.	0Ω		
V 3	6J6	†10KΩ	†10KΩ	0Ω	.1Ω	100KΩ	100KΩ	0Ω		
V 4	6AU6	770KΩ	0Ω	.1Ω	0Ω	†4.8KΩ	†4.8KΩ	0Ω		
V 5	6AU6	670KΩ	0Ω	.1Ω	0Ω	†4.8KΩ	†4.8KΩ	68Ω		
V 6	6AU6	570KΩ	0Ω	.1Ω	0Ω	†4.8KΩ	†4.8KΩ	68Ω		
V 7	6AU6	5.6KΩ	0Ω	.1Ω	0Ω	†12KΩ	†4.8KΩ	120Ω		
V 8	6AL5	.1Ω	0Ω	.1Ω	0Ω	Inf.	0Ω	5.6KΩ		
V 9	6AU6	1 Meg.	0Ω	.1Ω	0Ω	†6KΩ	†2.8KΩ	2.5KΩ		
V 10	6AQ5	1 Meg.	680Ω	.1Ω	0Ω	†5.5KΩ	†5.5KΩ	1 Meg.		
V 11	12AU7	27KΩ	0Ω	270KΩ	.1Ω	.1Ω	†11KΩ	1 Meg. .	3.9KΩ	0Ω
V 12	6AU6	150KΩ	0Ω	.1Ω	0Ω	†35KΩ	†35KΩ	0Ω		
V 13	6AL5	Inf.	Inf.	.1Ω	0Ω	10KΩ	0Ω	10KΩ		
V 14	6AU6	20Ω	0Ω	.1Ω	0Ω	†470KΩ	†2.2Meg.	330Ω		
V 15	6K6GT	0Ω	0Ω	†2KΩ	†1.8KΩ	470KΩ	†10KΩ	.1Ω	680Ω	
V 16	6SN7GT	1.3Meg.	#2 Meg. #1.1Meg.	0Ω	2.2 Meg.	#850Ω	2.5KΩ 8Ω	.1Ω	0Ω	
V 17	6AL5	5.6KΩ	5.6KΩ	.1Ω	0Ω	4.8 Meg.	0Ω	4.8 Meg.		
V 18	6SN7GT	100KΩ	#270KΩ	1000Ω	5.2 Meg.	†7.5KΩ	1000Ω	.1Ω	0Ω	
V 19	6BG6G	Inf.	0Ω	56Ω	Inf.	470KΩ	Inf.	.1Ω	†3KΩ	TOP CAP #240Ω
V 20	5V4G	Inf.	100KΩ	Inf.	†70Ω	Inf.	†70Ω	Inf.	100KΩ	
V 21	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #400Ω
V 22	5U4G	Inf.	10KΩ	Inf.	19Ω	Inf.	17Ω	†65Ω	10KΩ	
V 23	10BP4	0Ω	310KΩ	PIN 10 †2.2KΩ	PIN 11 42KΩ	PIN 12 .1Ω				

† MEASURED FROM PIN 2 OF V22.
# MEASURED FROM PIN 8 OF V20.

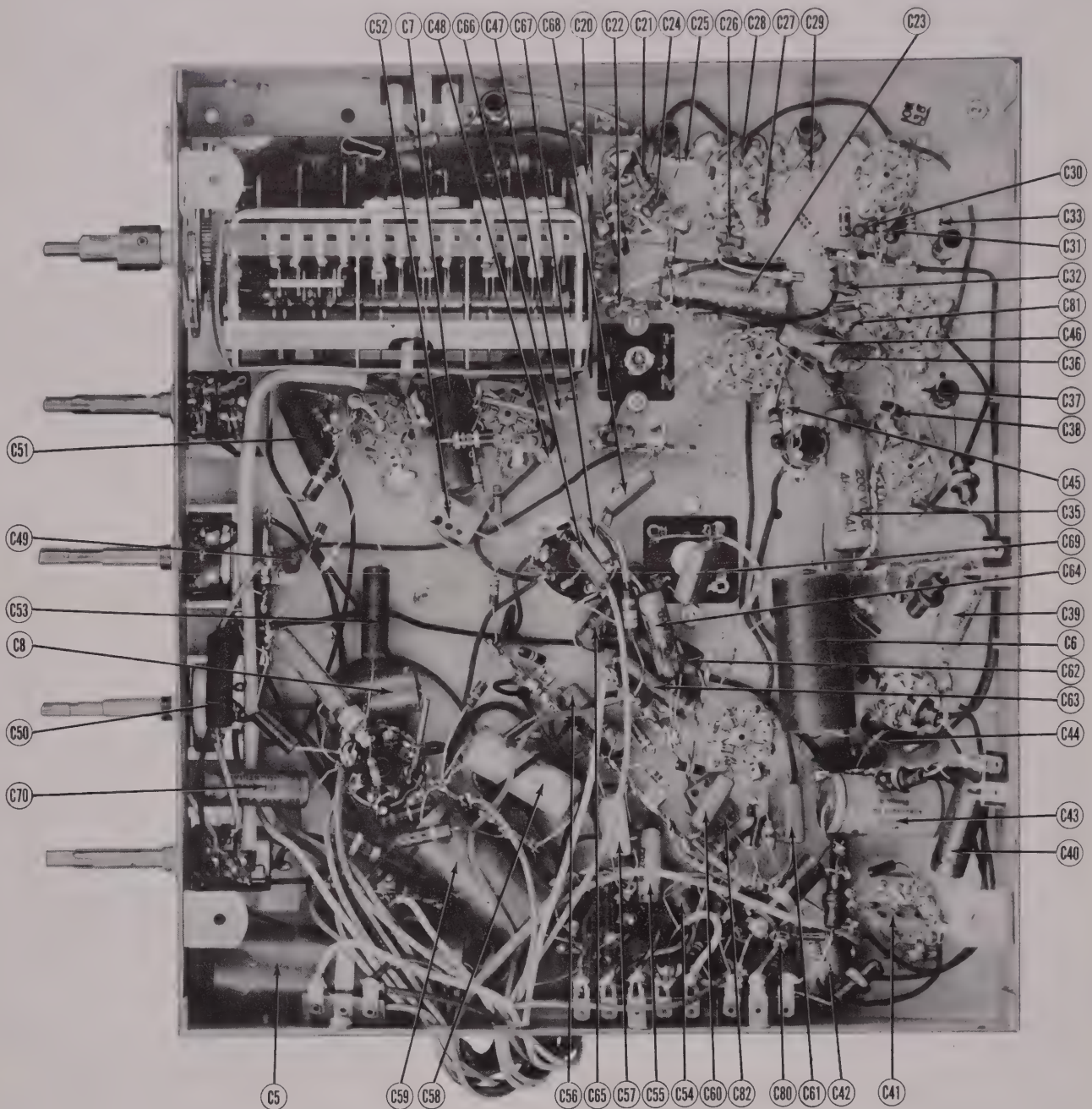
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



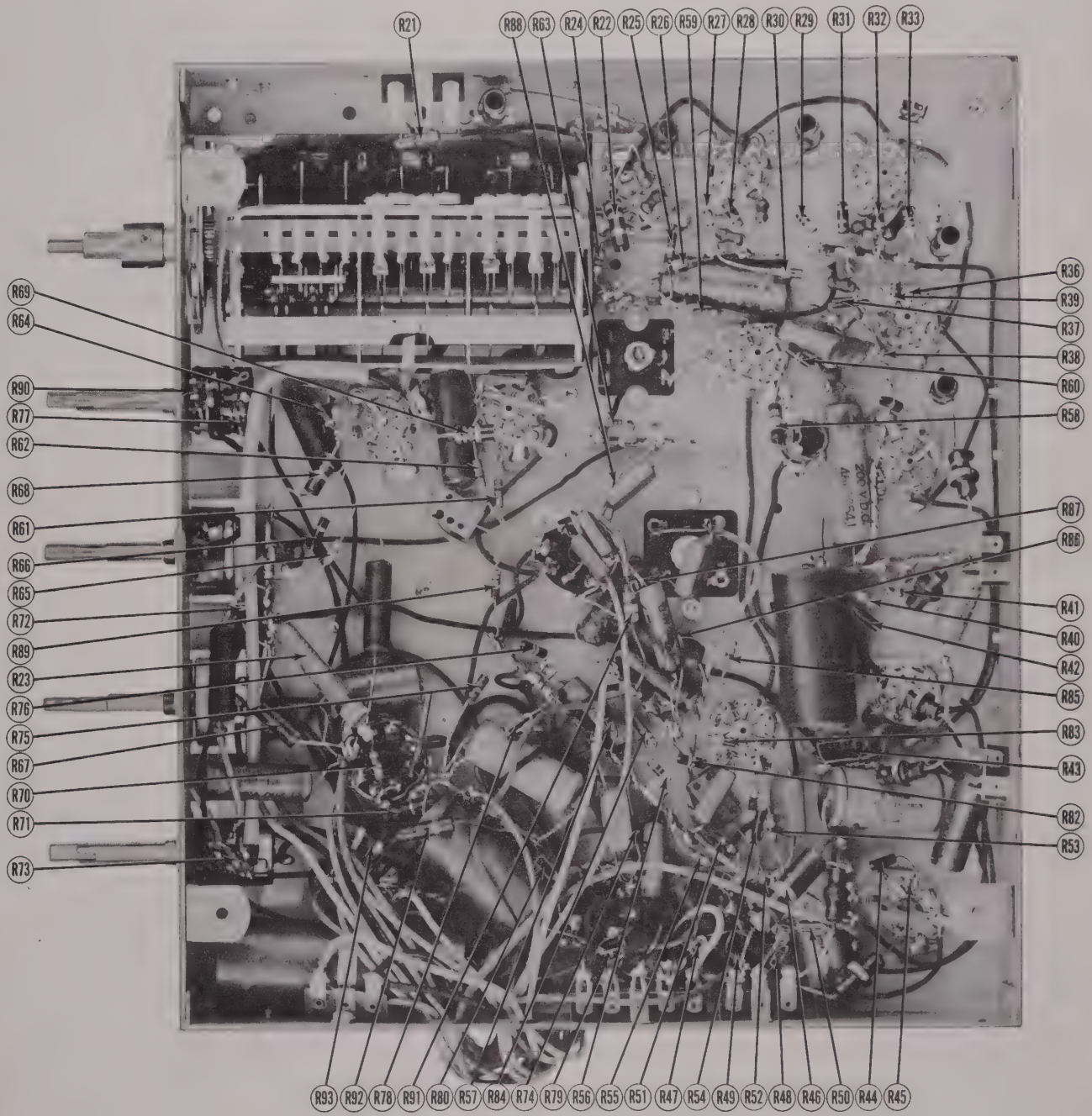
RF TUNER-RIGHT SIDE



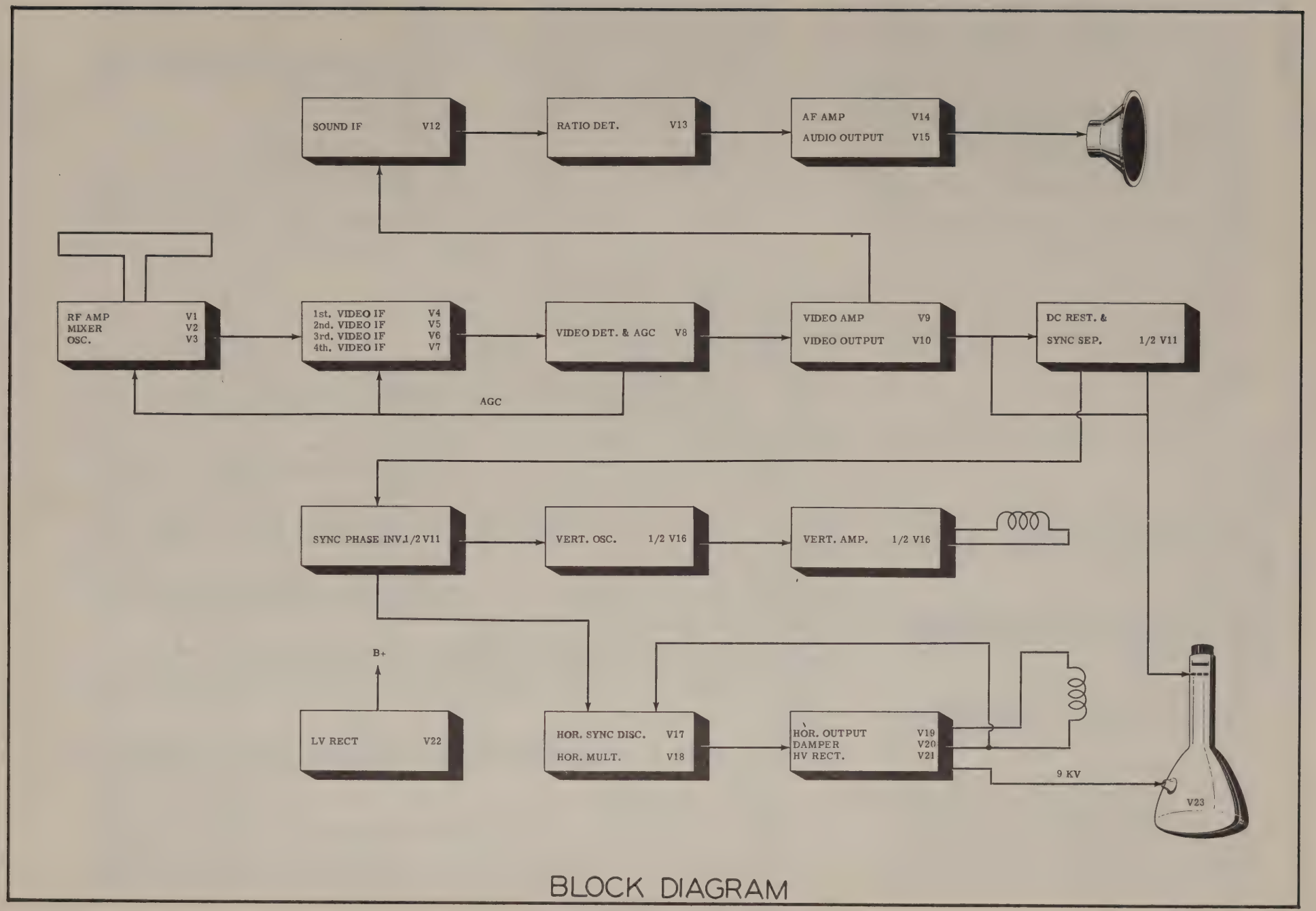
RF TUNER-LEFT SIDE



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



BLOCK DIAGRAM

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: DELCO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	5254	6J6	7BF	
V2	Mixer	5254	6J6	7BF	
V3	Oscillator	5254	6J6	7BF	
V4	1st Video IF	5260	6AU6	7BK	
V5	2nd Video IF	5260	6AU6	7BK	
V6	3rd Video IF	5260	6AU6	7BK	
V7	4th Video IF	5260	6AU6	7BK	
V8	Video Det & AGC	5251	6AL5	6BT	
V9	Video Amp.	5260	6AU6	7BK	
V10A	Video Output	5268	6AQ5	7BZ	
B	Video Output	5241	6V6GT	7AC	
V11A	DC Rest. -Sync. Sep. -Phase Inverter	5328	12AU7	9A	
B	DC Rest. -Sync. Sep. -Phase Inverter	5258	6SN7GT	8BD	
V12	Sound IF Amp.	5260	6AU6	7BK	
V13	Ratio Det.	5251	6AL5	6BT	
V14	AF Amp.	5260	6AU6	7BK	
V15	Audio Output	5196	6K6GT	7S	
V16	Vert. Osc. -Vert. Amp.	5258	6SN7GT	8BD	
V17	Hor. Sync. Disc.	5251	6AL5	6BT	
V18	Hor. Multivibrator	5258	6SN7GT	8BD	
V19	Hor. Output	5269	6BG6G	5BT	
V20	Damper	5118	5V4G	5L	
V21	HV Rectifier	5056	1B3GT	3C	
V22	LV Rectifier	5117	5U4G	5T	
V23	Picture Tube	5531	10BP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: DELCO PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	1219212	PRSA450/40-40	EDJ10118		TVL-64†	Filter
B	40	450						Filter
C2	80	450	1219211	PRSA450/40-40	EZ10074		TVL-9 †	Filter
C3A	250	10	1219209	PRS12/250	EZ10095		TVL-66†	Hor. Cent. Cont. Bypass-Red
B	1000	6		PRS6/1000				Vert. Cent. Cont. Bypass-Yellow
C4A	30	450	1219213	PRS450/30-30			TVL-55†	Filter-Red
B	30	350		PRS350/40				Filter-Yellow
C	30	250						Filter-Blue
C5A	10	450	1219210	AF222J †	EZ10090		D13422	Decoupling-Red
B	10	450		PRS50/100				Decoupling-Red
C	10	450						Decoupling-Blue
D	150	50						Vert. Amp. Cath. Byp.-Yellow
C6A	8	300	1219214	PRS450/8-8	BRD1145		TVA-25	Decoupling
B	8	300						Decoupling
C7	5	50	J051	PRS150/4	BR550		TVA-13	Stabilizing Cap.
C8	10	25	J100	PRS25/10	BR102A		TVA-5	Output Cathode Bypass
C9	300		1218950	GP300M		GP2K-300		RF Coupling
C10	300		1218950	GP300M		GP2K-300		RF Coupling
C11	1500		1219298	GP1500M		GP2L-0015		AGC Filter
C12	1.5		1218897			NPOK-1.5		Neutralizing
C13	1.5		1218897			NPOK-1.5		Neutralizing
C14	500		1219296	GP500M		GP2K-500		RF Filament Bypass
C15	1500		1219298	GP1500M		GP2L-0015		Mixer Grid Filter
C16	4.7		1218408	CN4.7CNPO		NPOK-4.7		Osc. Feedback
C17	4.7		1218408	CN4.7CNPO		NPOK-4.7		Osc. Feedback
C18	500		1219296	GP500M		GP2K-500		Osc. Filament Bypass
C19	500		1219296	GP500M		GP2K-500		Decoupling
C20	100		1218949	GP100M	5W5T1	GP1K-100	1FM-31	IF Coupling
C21	1000		1219297	GP1000M	1W5D1	GP2L-001	1FM-21	Mixer Plate Decoupling
C22	1000		1219297	GP1000M	1W5D1	GP2L-001	1FM-21	AGC Filter
C23	.25	200	E254	P488-25	GT2P25		TC-2	AGC Filter
C24	1000		1219297	GP1000M	1W5D1	GP2L-001	1FM-21	1st IF Decoupling
C25	100		1218949	GP100M	5W5T1	GP1K-100	1FM-31	IF Coupling
C26	1000		1219297	GP1000M	1W5D1	GP2L-001	1FM-21	AGC Filter
C27	1000		1219297	GP1000M	1W5D1	GP2L-001	1FM-21	2nd IF Decoupling
C28	1000		1219297	GP1000M	1W5D1	GP2L-001	1FM-21	2nd IF Fil. Bypass
C29	100		1218949	GP100M	5W5T1	GP1K-100	1FM-31	IF Coupling
C30	1000		1219297	GP1000M	1W5D1	GP2L-001	1FM-21	AGC Filter
C31	1000		1219297	GP1000M	1W5D1	GP2L-001	1FM-21	3rd IF Decoupling
C32	1000		1219297	GP1000M	1W5D1	GP2L-001	1FM-21	RF Bypass
C33	100		1218949	GP100M	5W5T1	GP1K-100	1FM-31	IF Coupling
C34	1000		1219297	GP1000M	1W5D1	GP2L-001	1FM-21	AGC Filter †
C35	.25	200	E254	P488-25	GT2P25		TC-2	AGC Filter
C36	5000		1219295	BPD-5	1D5D5	811-005	29C1	4th IF Decoupling
C37	100		1218949	GP100M	5W5T1	GP1K-100	1FM-31	IF Coupling
C38	10		1218898	GP10M	5W5Q1	GP1K-10	MS-41	V. Diode Filter
C39	.05	200	E503	P288-05	PTE4S5		TM-15	Video Coupling
C40	.05	500	E503	P688-05	PTE6S5		TM-15	Video Coupling
C41	470	500	G471	1468-0005	5W5T5	GP2K-470	1FM-35	2nd V. Amp. Cath. Bypass
C42	.1	600	E104	P688-1	PTE6P1		TM-1	Video Coupling
C43	.25	600	E254	684-25	GT6P25		TC-2	Video Coupling
C44	1.5		1218897			NPOK-1.5		S. IF Coupling
C45	100		1218949	GP100M	5W5T1	GP1K-100	1FM-31	S. IF Coupling
C46	.01	200	E103	P488-01	PTE4S1	GP2-335-01	TM-11	S. IF Decoupling
C47	330		1218950	GP330M	5W5T3	GP2K-330	1FM-335	Diode Load Cap. *
C48	330		1218950	GP330M	5W5T3	GP2K-330	1FM-335	Diode Load Cap. *
C49	1000		1219297	GP1000M	1W5D1	GP2L-001	1FM-21	De-emphasis
C50	.01	600	E103	P688-01	PTE6S1	GP2-335-01	TM-11	Audio Coupling
C51	.01	600	E103	P688-01	PTE6S1	GP2-335-01	TM-11	AF Amp. Screen Bypass
C52	470	500	G471	1468-0005	5W5T5	GP2K-470	1FM-35	AF Amp. Plate Bypass
C53	.01	600	E103	P688-01	PTE6S1	GP2-335-01	TM-11	Audio Coupling

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: DELCO PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C54	.05	600	E503	P688-05	PTE6S5		TM-15	Sync. Coupling
C55	.002	600	E202	P688-002	PTE6D2	GP2M-002	TM-22	Integrator Net.
C56	.005	600	E502	P688-005	PTE6D5	GP2M-005	TM-25	Integrator Net.
C57	4700	500	G472	1467-005	1D5D5	GP2M-005	1FM-25	Vert. Osc. Grid Cap.
C58	.1	600	E104	P688-1	PTE6P1		TM-1	Vert. Discharge
C59	.25	600	E254	684-25	GT6P25		TC-2	Vert. Sweep Coupling
C60	1500	500	G152	1467-0015	1W5D15	GP2L-0015	1FM-215	Hor. Sync. Coupling
C61	1500	500	G152	1467-0015	1W5D15	GP2L-0015	1FM-215	Hor. Sync. Coupling
C62	.02	600	E203	P688-02	PTE6S2		TM-12	AFC Filter
C63	.005	600	E502	P688-005	PTE6D5	GP2M-005	TM-25	Hor. Feedback
C64	.005	600	E502	P688-005	PTE6D5	GP2M-005	TM-25	AFC Filter
C65	.005	600	E502	P688-005	PTE6D5	GP2M-005	TM-25	AFC Filter
C66	330	500	G331	1468-00035	5W5T3	GP2K-330	1FM-335	Hor. MV Feedback
C67	47	500		1468-00005	5W5Q5	GP1K-47	1FM-45	Hor. MV Feedback †
C68	220	500	G221	1468-00025	5W5T25	GP2K-220	1FM-325	Hor. Discharge
C69	6200	500	1219378					Fixed Trimmer
C70	.1	200	E104	P288-1	PTE4P1		TM-1	Pic. Tube Cath. Dec.
C71	390	500	G391	1468-0004	5W5T4	GP2K-390	1FM-34	Hor. Sweep Coupling
C72	220	500	G221	1468-0002	5W5T2	GP2K-220	1FM-32	Voltage Divider †
C73	.01	600	E103	P688-01	PTE6S1	GP2-335-01	TM-11	Hor. Output Screen Bypass
C74	.1	600	E104	P688-1	PTE6P1		TM-1	Damper Filter
C75	.02	600	E203	P688-02	PTE6S2		TM-12	Damper Filter
C76	.01	600	E103	P688-01	PTE6S1	GP2-335-01	TM-11	RF Bypass †
C77	500	10000	1219208					HV Filter
C78	.01	600	1219217	P688-01	PTE6S1		TM-11	Line Filter
C79	.01	600	1219217	P688-01	PTE6S1		TM-11	Line Filter
C80	15			GP15M		GP1K-15	MS-415	DC Res. Plate Bypass †
C81	1000		1219297	GP1000M	1W5D1	GP2L-001	1FM-21	4th IF Cath. Bypass †
C82	220	500		1468-00025	5W5T25	GP2K-220	1FM-325	Hor. Sync. Coupling †

* When either item C47 or C48 are replaced, replace both with capacitors of equal value.
† Not used in all models.
‡ Use mounting strap.
§ Parallel sections to obtain desired capacity.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DELCO PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	INSTALLATION NOTES
R1A	50KΩ	½		B11-123 *		Brightness control, front
B	1 Meg.	½		B13-137 *		Volume control, rear
C	Shaft End		1219410	E202 *		Attach per instructions in "Concentrikit".
D	Switch			76-1 *		Attach per instructions in "Concentrikit".
R2	2500Ω	2	1219242			Contrast control. Wire Wound
R3A	50KΩ	½		B11-123 *		Horiz. hold control, front
B	1 Meg.	½	1219250	B11-137 *		Vert. hold control, rear
C	Shaft End			E202 *		Attach per instructions in "Concentrikit".
R4A	5000Ω	½	1219249	QU-114	AM-19-S	Vert. linearity control
B	Shaft		Not Req.	RQ	KSS-3 #	Attach to R4A per instructions
R5A	2.5 Meg.	½	1219248	QU-239	AM-84-S	Height control
B	Shaft		Not Req.	RQ	KSS- 3 #	Attach to R5A per instructions
R6	20Ω	2	1219246	W-20 #	43-20 #	Horiz. centering control, Wire Wound
R7	20Ω	2	1219245	W-20X10 #	43-20CT #	Vert. centering control, Wire Wound, tapped at 10Ω
R8	2500Ω	4	1219247		10-2500 #	Focus control, Wire Wound

File slot in shaft to duplicate original.
* Additional parts to be used with "Concentrikit".

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DELCO PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R9	150Ω	½	A151		RF Grid
R10	150Ω	½	A151		RF Grid
R11	1000Ω 20%	1	A102	BTS-1000	AGC Network
R12	10KΩ	½	A103	BTS-10K	RF Coil Shunt
R13	1000Ω 20%	1	A102	BTS-1000	RF Plate
R14	1000Ω 20%	1	A102	BTS-1000	RF Plate
R15	5600Ω	½	A562	BTS-5600	Mixer Coil Shunt
R16	1 Meg. 20%	½	A105	BTS-1 Meg.	Mixer Grid
R17	1000Ω 20%	1	A102	BTS-1000	Osc. Plate
R18	1000Ω 20%	1	A102	BTS-1000	Osc. Plate
R19	100KΩ 20%	½	A104	BTS-100K	Osc. Grid
R20	100KΩ 20%	½	A104	BTS-100K	Osc. Grid
R21	33Ω 20%	2	A330		Parasitic Supp.
R22	4700Ω	1	B472		Mixer Plate Decoupling
R23	6800Ω 20%	2	C682	BT-2-6800	Decoupling
R24	820Ω	½	A822	BTS-8200	1st Video IF Grid
R25	2200Ω	½	A222	BTS-2200	1st Video IF Decoupling
R26	100KΩ	½	A104	BTS-100K	AGC Network
R27	5600Ω	½	A562	BTS-5600	2nd Video IF Grid
R28	68Ω	½	A680		2nd Video IF Cathode
R29	2200Ω	½	A222	BTS-2200	2nd Video IF Decoupling
R30	100KΩ	½	A104	BTS-100K	AGC Network
R31	6800Ω	½	A682		3rd Video IF Grid
R32	68Ω	½	A680		3rd Video IF Cathode
R33	2200Ω	½	A222	BTS-2200	3rd Video IF Decoupling
R34	100KΩ	½	A104	BTS-100K	AGC Network See Note 1
R35	220KΩ	½	A224	BTS-220K	AGC Network See Note 1
R36	5600Ω	½	A562	BTS-5600	4th Video IF Grid
R37	120Ω	½	A121		4th Video IF Cathode See Note 2

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DELCO PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R38	8200Ω	½	A822	BTS-8200	4th Video IF Plate
R39	2200Ω	½	A222	BTS-2200	4th Video IF Decoupling
R40	470KΩ	½	A474	BTS-470K	AGC Network
R41	5600Ω	½	A562	BTS-5600	Video Det. Diode Load
R42	1 Meg. 20%	½	A105	BTS-1 Meg.	Video Amp. Grid
R43	3300Ω	1	B332	BTA-3300	Video Amp. Plate
R44	1 Meg. 20%	½	A105	BTS-1 Meg.	Video Output Grid
R45	68Ω	½	A681	BTS-680	Video Output Cathode
R46	4700Ω	2	C472	BT-2-4700	Video Output Plate
R47	47KΩ	½	A473	BTS-47K	Picture Tube Grid
R48	27KΩ	½	A273	BTS-27K	Voltage Divider
R49	270KΩ	½	A274	BTS-270K	DC Rest. Load
R50	1 Meg. 20%	½	A105	BTS-1 Meg.	Sync. Sep. Plate
R51	3900Ω	½	A392	BTS-3900	Sync. Phase Inv. Plate
R52	3900Ω	½	A392	BTS-3900	Sync. Phase Inv. Plate
R53	3900Ω	½	A392	BTS-3900	Sync. Phase Inv. Cathode
R54	1 Meg. 20%	½	A105	BTS-1 Meg.	Sync. Phase Inv. Grid
R55	15KΩ	½	A153	BTS-15K	Integrator
R56	8200Ω	½	A822	BTS-8200	Integrator
R57	8200Ω	½	A822	BTS-8200	Integrator
R58	150KΩ	½	A154		Sound IF Grid
R59	33KΩ	½	A333	BTS-33K	Sound IF Decoupling
R60	12KΩ	½	A123	BTS-12K	Voltage Divider
R61	10KΩ 5%	½	A103	BTS-10K-5%	Ratio Det. Diode Load
R62	10KΩ 5%	½	A103	BTS-10K-5%	Ratio Det. Diode Load
R63	33KΩ	½	A333	BTS-33K	De-emphasis
R64	330Ω	½	A331	BW-½-330	AF Cathode
R65	470KΩ	½	A474	BTS-470K	AF Plate
R66	2.2 Meg.	½	A225	BTS-2.2 Meg.	AF Screen
R67	1000Ω 20%	2	C102	BT-2-1000	Decoupling
R68	68KΩ	1	B683	BTA-68K	Voltage Divider
R69	4.7Ω	1		BW-1-4.7	AF Filament See Note 1
R70	470KΩ	½	A474	BTS-470K	Output Grid
R71	68Ω	1	B681	BTA-680	Output Cathode
R72	180KΩ	½	A184	BTS-180K	Voltage Divider
R73	15KΩ	½	A153	BTS-15K	Voltage Divider
R74	1.2 Meg.	½	A125	BTS-1.2 Meg.	Vert. Osc. Grid
R75	6.8 Meg. 20%	½	A685	BTS-6.8 Meg.	Voltage Divider
R76	100KΩ	½	A104	BTS-100K	Voltage Divider
R77	1.2 Meg.	½	A125	BTS-1.2 Meg.	Voltage Divider
R78	1.5 Meg. 20%	½	A155	BTS-1.5 Meg.	Vert. Osc. Plate
R79	2.2 Meg.	½	A225	BTS-2.2 Meg.	Vert. Amp. Grid
R80	3300Ω	½	A332	BTS-3300	Vert. Peaking
R81	3300Ω 20%	½	A332	BTS-3300	Voltage Divider See Note 1
R82	100KΩ	½	A104	BTS-100K	Horiz. Sync. Disc. Load
R83	100KΩ	½	A104	BTS-100K	Horiz. Sync. Disc. Load
R84	4.7 Meg. 20%	½	A475	BTS-4.7 Meg.	Horiz. Sync. Disc. Load
R85	5600Ω	½	A562	BTS-5600	Feedback Network
R86	470KΩ	½	A474	BTS-470K	Horiz. AFC Filter Network
R87	6800Ω	1	B682	BTA-6800	Horiz. MV Plate
R88	1000Ω	½	A102	BTS-1000	Horiz. MV Cathode
R89	68KΩ	½	A683	BTS-68K	Horiz. MV Grid
R90	47KΩ	½	A473	BTS-47K	Voltage Divider
R91	270KΩ	½	A274	BTS-270K	Horiz. MV Plate
R92	20Ω 5%	1	B200		Vert. Deflection Shunt
R93	390Ω	2	C391	BW-2-390	Vert. Deflection Shunt See Note 3
R94	470KΩ	½	A474	BTS-470K	Horiz. Output Grid See Note 4
R95	47Ω	½	A470		Parasitic Supp.
R96	56Ω	1	B560	BW-1-56	Horiz. Output Cathode
R97	2200Ω	2	C222	BT-2-2200	Horiz. Output Screen
R98	220Ω	1	B221	BW-1-220	Decoupling
R99	1000Ω	½	A102	BTS-1000	Feedback
R100	47Ω	1	B470	BW-1-47	Width Coil Shunt See Note 6
R101	3.3Ω	½	1214564		HV Rect. Filament
R102	1 Meg.	1	B105		HV Filter
R103	2200Ω	1	B222	BTA-2200	Focus Coil Shunt
R104	470Ω	2	C471	BW-2-470	Series Focus Coil
R105	13000Ω	20			Filter-Wire Wound-See Note 5
R106	1100Ω	20	1219215		Filter-Wire Wound-See
R107	8200Ω	10	1219216	AB-8000	Bleeder-Wire Wound

Note 1. Not used in all models.
Note 2. Some models use 68Ω resistor in this application.
Note 3. Some models use 200Ω, 1 watt resistor in this application.
Note 4. Some models use 100KΩ resistor in this application.
Note 5. Some models use 100Ω, 20 watt resistor in this application.
Note 6. Some models use two resistors, in parallel, to obtain required resistance and wattage.

SPEAKER

ITEM No.	RATINGS: FIELD RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: DELCO PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1	65Ω	3.6Ω	1219300		6E ②	②Supplied on order. Give field resistance and current.
	CONE DIA.	V. C. DIA.				
SP2	6 1/8"	9/16"				

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	DELCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC at 2.1A	780VCT .250ADC	5VAC at 3A	6.3VAC at 8A	1219265	P-8156 ③		TP-410

③ Mount vertically with universal mounting brackets. Rewire heater circuit as required.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE		REPLACEMENT DATA DELCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
	PRI.	SEC.					
T2	40Ω		1219263				Hor. Sweep Osc. Coil
T3	120Ω	1400Ω	1219264	A-8111	A-3000	TBO-1	Vert. Block Osc. Trans.
T4	385Ω	SEC. 1	1219409	A-8117		TFB-1	Hor. Output Trans.
	Tap at 210Ω	14.2Ω Tap at .65Ω					
		SEC. 2					
		0Ω					
T5	590Ω	7Ω	1219267	A-8115	A-3035	TSO-1	Vert. Output Trans.
T6A	14Ω		1219260	DY-1			Hor. Deflection Coil
B	68Ω						Vert. Deflection Coil
T7	250Ω		1219239	FC-10			Focus Coil

TRANSFORMER (AUDIO OUTPUT)

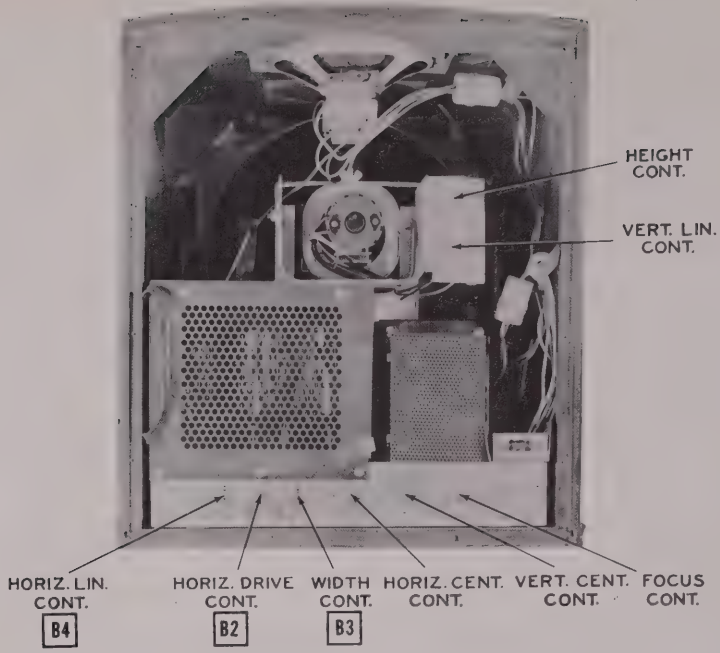
ITEM No.	RATING IMPEDANCE		RATING DC RES.		REPLACEMENT DATA DELCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
	PRI.	SEC.	PRI.	SEC.					
T8	7.8KΩ	3.6Ω	280Ω	.4Ω	Part of 1219300	A-8114 ①	A-2931 ①	RO-13 ①	① Bend mounting tabs down and mount on original bracket.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA DELCO PART No.	MEISSNER PART No.	NOTES
		PRI.	SEC.			
L1	Ant. Input	.1Ω				Part of tuner.
L2	RF Coil	0Ω				Part of tuner. Low-Band
L3	Mixer Grid	0Ω				Part of tuner. Low-Band
L4	RF Coil	0Ω				Part of tuner. High-Band
L5	Mixer Grid	0Ω				Part of tuner. High-Band
L6	Osc. Coil	0Ω				Part of tuner. Low-Band
L7	Osc. Coil	0Ω				Part of tuner. High-Band
L8	1st Video IF	.1Ω		1219233		
L9	2nd Video IF	.1Ω		1219233		
L10	3rd Video IF	.1Ω		1219233		
L11	4th Video IF	.1Ω		1219233		
L12	5th Video IF	.1Ω		1219233		
L13	Peaking	10Ω		1219234		Wound on 39KΩ resistor.
L14	Peaking	11Ω		1219235		Wound on 1 Meg. resistor.
L15	Peaking	9Ω		1219238		Wound on 47KΩ resistor.
L16	Peaking	6Ω		1219236		Wound on 1 Meg. resistor.
L17	Peaking	8.5Ω		1219237		Wound on 1 Meg. resistor.
L18	Peaking	6.5Ω		1219236		Wound on 1 Meg. resistor.
L19	Sound IF	4.1Ω		1218952		
L20	Ratio Det. Trans.	4.5Ω	1Ω	1219064		
L21	Width Cont.	.4Ω		1219241		
L22	Hor. Linearity	32Ω		1219240		

MISCELLANEOUS

ITEM No.	PART NAME	DELCO PART No.	NOTES
M1	RF Tuner	1219299	Complete
M2	Size Switch	1219411	
M3	Ion Trap	1219259	
M4	Fuse	446657	Type 3AG .25A
	Cabinet	1219376	
	Cabinet Back	1219377	
	Safety Glass	1219412	
	Knob	1219414	Vert. hold, On-Off Volume
	Knob	1219372	Hor. hold, Brightness
	Knob	1219373	Size SW, Contrast
	Knob	1219374	Channel Selector
	Knob	1219371	Fine Tuning



CABINET-REAR VIEW

HORIZONTAL FREQUENCY AND LINEARITY ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern, and turn the horizontal hold control to the center of its range. Set the "normal-large" switch to "normal".

Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B2) clockwise as far as possible without crowding the right half of the picture or causing instability in the raster.

Adjust the width slug (B3) until the picture fills the mask horizontally.

Adjust the horizontal linearity slug (B4) until the picture is symmetrical from left to right. Slight readjustment of B2 may be required to obtain optimum results.

No further adjustments of the horizontal circuits should be required for the "large" position.

DISASSEMBLY INSTRUCTIONS

1. Remove five push-on type control knobs.
2. Remove eight screws holding rear cover. Remove cover.
3. Disconnect four plugs connecting HV chassis to TV chassis. Remove picture tube HV cap.
4. Remove four screws holding HV chassis. Remove HV chassis.
5. Disconnect speaker plug.
6. Remove four 5/16" hex nuts holding speaker. Remove speaker.
7. Remove four screws holding TV chassis. Remove chassis.

MODEL P-3

FIGURE 1

INTERNATIONAL ELECTRONICS
MODEL P-3

GENERAL INFORMATION

The International Electronics P-3 Recorder unit is designed to magnetically record on a standard 7-inch reel of ¼-inch-wide tape, two tracks instead of one, which doubles the playing time with no loss in frequency response or quality. One track is recorded or played back during forward movement of the tape, and the other track during reverse tape travel. This two-way utilization of travel eliminates the necessity of rewinding.

This recording unit incorporates an automatic reversing switch and solenoid which instantaneously reverses the direction of the tape travel at the end of the reel. The tape may be rewound, in high speed, in forward or reverse position without rethreading. Rewind time is approximately 7 minutes.

Line Voltage: 105/120 Volts AC, 60 Cycles.

Manufactured by: **INTERNATIONAL ELECTRONICS COMPANY**
808 North Broad Street • Philadelphia 30, Pa.

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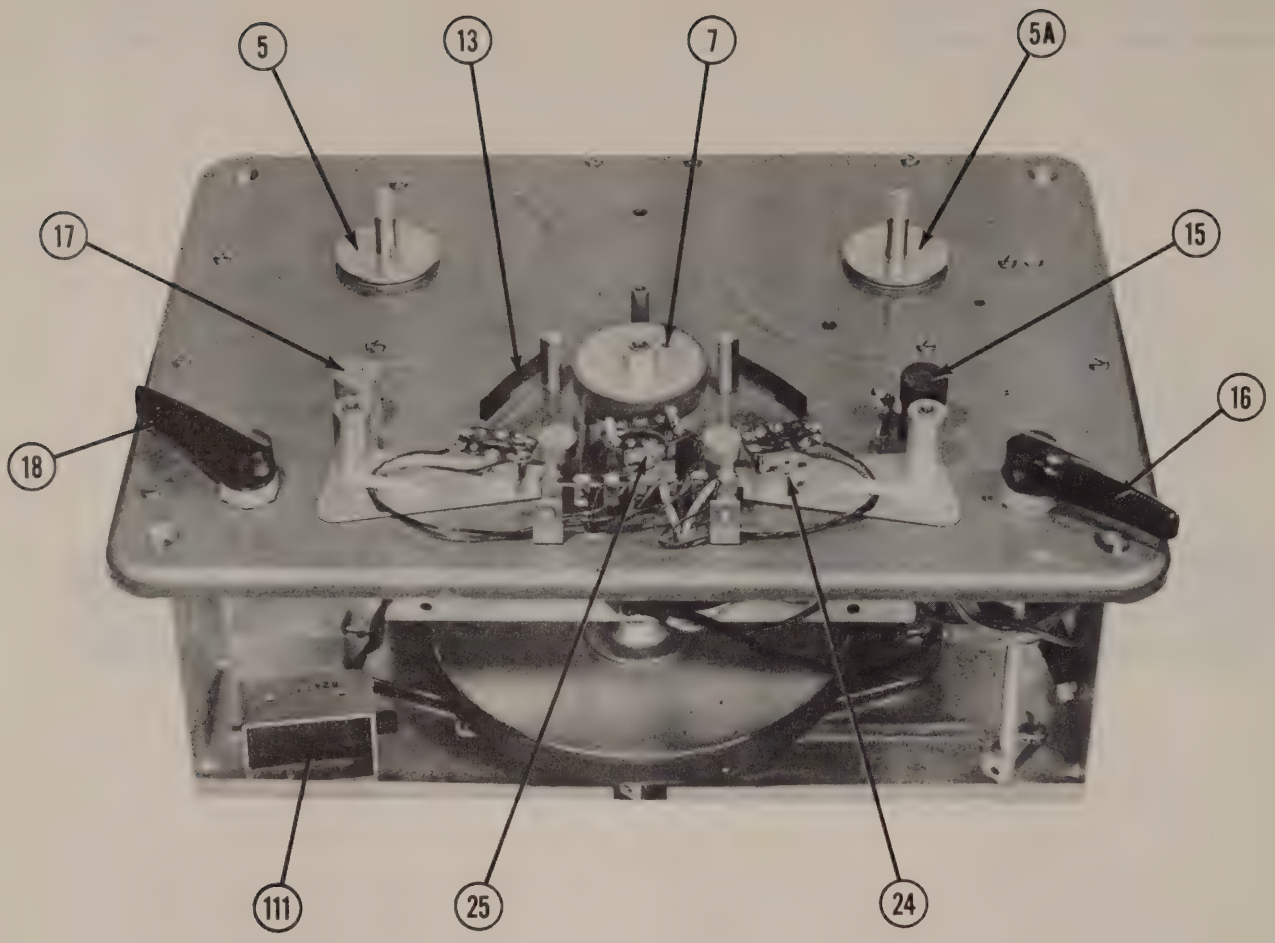

FIG. 2—TOP VIEW LESS BEZELS

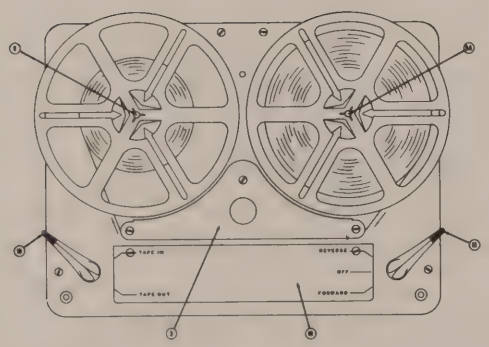

FIG. 3—THREADING OF TAPE DIAGRAM

OPERATING INSTRUCTIONS

Threading of Tape: Fig. (3)

1. Turn the control knob (18) to the "Tape Out" position. This operation pivots the right and left-hand erase heads (24) and the recording head (25) away from their play position. This provides clearance for threading the tape.

2. Place a full reel of tape on the platform (5A) in a position so the tape will unwind in a clockwise direction. The black coating of the tape should face outward on the reel.

3. Pull the tape through the slot between the rear bezel (3) and the front bezel (10).

4. Place an empty reel on the takeup reel platform (5) and feed the end of the tape up through one of the slots in the reel. Hold the end of the tape and rotate the reel in a clockwise direction four or five revolutions. Make sure the black coating of the tape is always facing outward.

Recording:

1. To make a recording, turn the control knob (18) to "Tape In" position. This pivots the erase heads (24) and recording head (25) into their normal playing position.

2. Turn the control knob (16) to "Forward" position. This starts the unit and also moves the recording head (25) to the upper half of the recording tape.

(a) The paper tape moves at a fixed rate of speed past the recording head (25) due to the position of the erase heads; i.e., when the control knob (18) is set for "Tape In." The erase heads in this position hold the tape in contact with the rubber surface of the capstan, which, as a result, set up a positive frictional condition between the tape and capstan. Since the R.P.M. of the capstan is much slower than that of the takeup reel and its associated parts, the resistance set up by the capstan causes the diaphragm (72) of the clutch assembly to slip a corresponding amount. This accounts for the high-speed winding when this friction condition is released at the time the control knob (18) is turned to the "Tape Out" position.

(b) A metallic backing is present near the end of the tape; therefore, with the unit operating in a forward position, this metallic coating contacts the reversing switch (15) and shorts it. This energizes the solenoid which switches the mechanism from forward to reverse.

Fast Speed Winding:

Fast speed winding may be accomplished by turning the control knob (18) to the "Tape Out" position. This action removes the drag set up by the tape and capstan (7), allowing the clutch assembly to operate without slipping. Reversing the direction of the tape at high speed may be done at will without spillage of the tape. Non-spilling of the tape is credited to the brake assembly (102), (104), and (112). Pressure is applied to clutch assemblies (74) by the brake assembly as the control knob (16) passes the neutral or "Off" position when it is switched from "Forward" to "Reverse," or vice versa. This neutral position of the control assembly stops the reels instantly, preventing any overrun of the reels.

To Repair or Splice Tape:

In case the tape is broken accidentally, or it is desired to

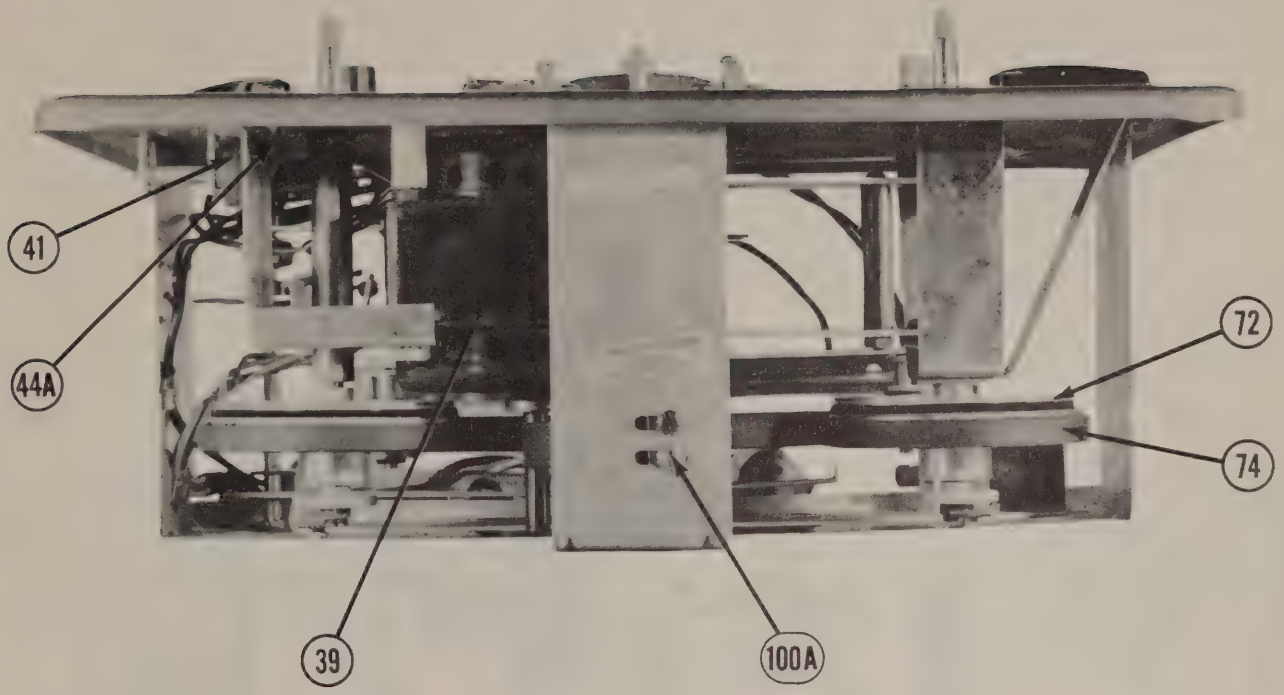

FIG. 4—BACK VIEW

edit the recording, a splice may be made with Scotch tape. Do not use medical adhesive tape as the adhesive material is not suitable for this purpose. The Scotch tape should be applied to the reverse, or uncoated, side of the recording tape. To assure proper operation of the unit, the edges of the splice should be trimmed with a small pair of scissors, or a knife, to bring the width of the splice to that of the rest of the recording tape.

MECHANICAL OPERATION AND ADJUSTMENTS

Forward Pulling Spring Adjustment:

The proper motor pressure applied to the main drive wheel (96) when in the "Forward" position is adjusted by means of the lock nut on the spade screw (65), located on the cam follower assembly (63). Measure this pressure with spring scale hooked on the rear lip of the right-hand motor support bracket (40) as close to the motor as possible. With the motor running in the "Forward" position, pull the spring scale back until the capstan (7) slips; then read the scale. Pressure measured with tape loaded and running should be 4½ to 5 lbs. Adjust the lock nut until the proper pressure is obtained; then coat the lock nut and screw threads with glyptol to hold the adjustment.

Rear Idler Wheel Adjustment:

With the motor running in "Reverse" direction, the rear idler wheel and bracket (101) is adjusted by loosening the two mounting screws (100A), Fig. 4, and sliding the bracket to the left (facing the rear of the machine) until the cam follower (63) has approximately 1/16" slack. The idler wheel *must* be horizontally aligned with the main drive wheel (96) for proper performance. Be sure the adjusting screws are tight after the adjustment is made.

Clutch Adjustment:

The clutch assemblies, diaphragm and hub assemblies (72), and clutch wheel (74), slip relative to each other due to the speed difference between the capstan and the clutch assembly. The friction between tape and capstan produces the drag forcing the clutch to slip. However, when this friction is removed by turning the control knob (18) to "Tape Out," there should be enough friction in the clutch assemblies to drive the reels at high speed. The following procedure is necessary to check and adjust the clutch assembly. With the motor running, check the pressure of the clutch with a spring scale hooked on to the reel at approximately a 3" radius and held at right angles to the reel spoke. Correct adjustment should read 3½ to 4 oz. The clutch pressure is varied by loosening the lock nut (85) and adjusting the knurled nut (84). After the correct adjustment has been reached, tighten the lock nut.

Brake Shoe Adjustment:

The brake shoes (102) must be adjusted to stop the reels immediately when the control knob (16) is placed in the neutral or "Off" position.

The brake shoes (102) are adjusted by loosening the screw which secures them to the brake arm assembly (112). With the machine in a neutral position, move the brake shoe *in* to contact the clutch wheel firmly; then tighten the screw. Fine adjustment can be made by slightly bending the brake shoe as required.

Brake pressure applied to the clutch wheel should be just enough to stop the reels immediately; too great a pressure may cause the shoes to drag on the clutch wheels while in playing position.

Tape Level Adjustment:

With the tape loaded and running, and with the control knob (18) in the "Tape In" position, the edge of the tape should run in line with the bottom edge of the capstan rubber (7) in both directions. To adjust the tape position as required, bend the tape arms (22) and (23) until proper adjustment is obtained.

Pressure Pads:

The pressure pads (13) apply just enough pressure to the tape to hold them against the erase heads (24). The pressure pads should be depressed approximately ¼ inch when the mechanism is in playing position (Tape In), and should be vertical and flat against the erase heads. The pressure pads

A PHOTOFACT "EXPLODED" VIEW

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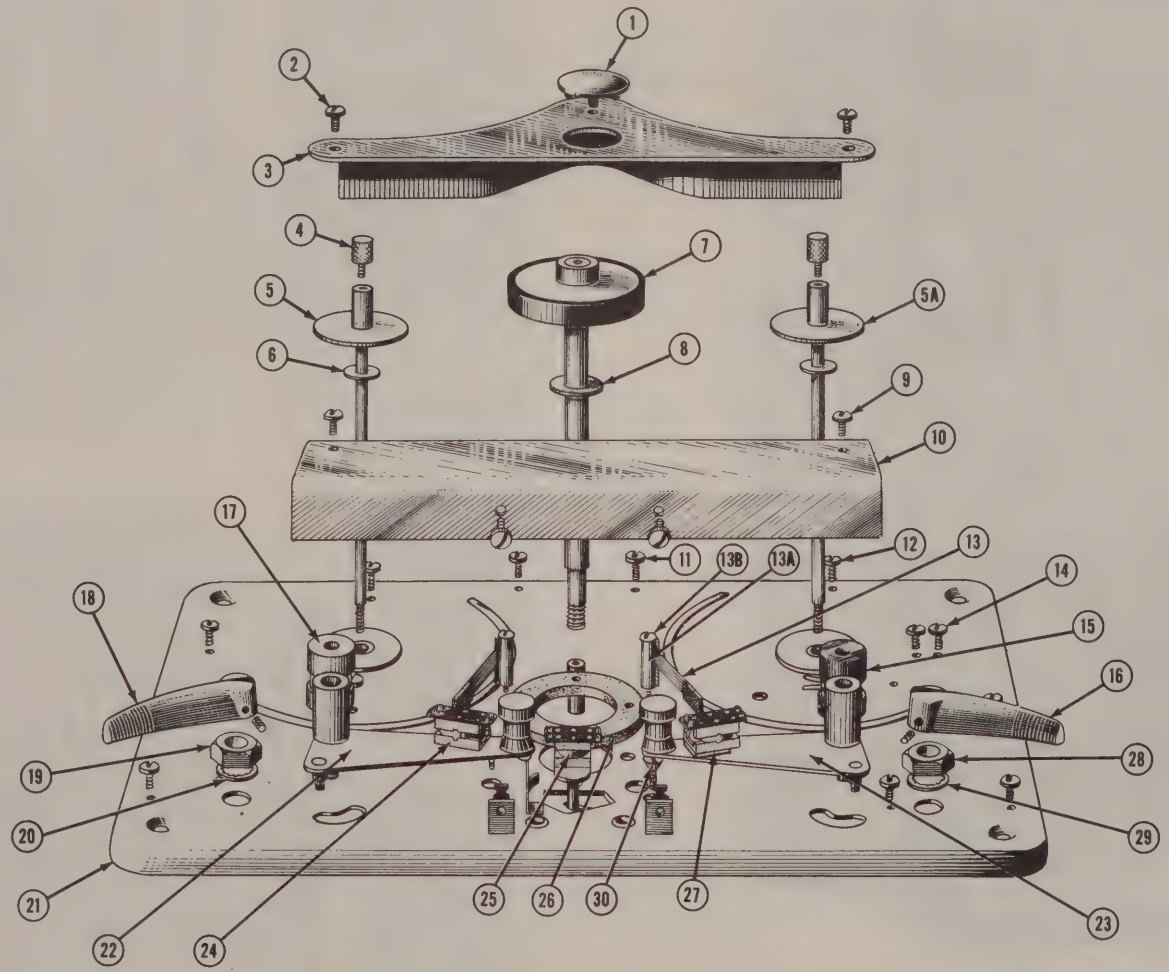

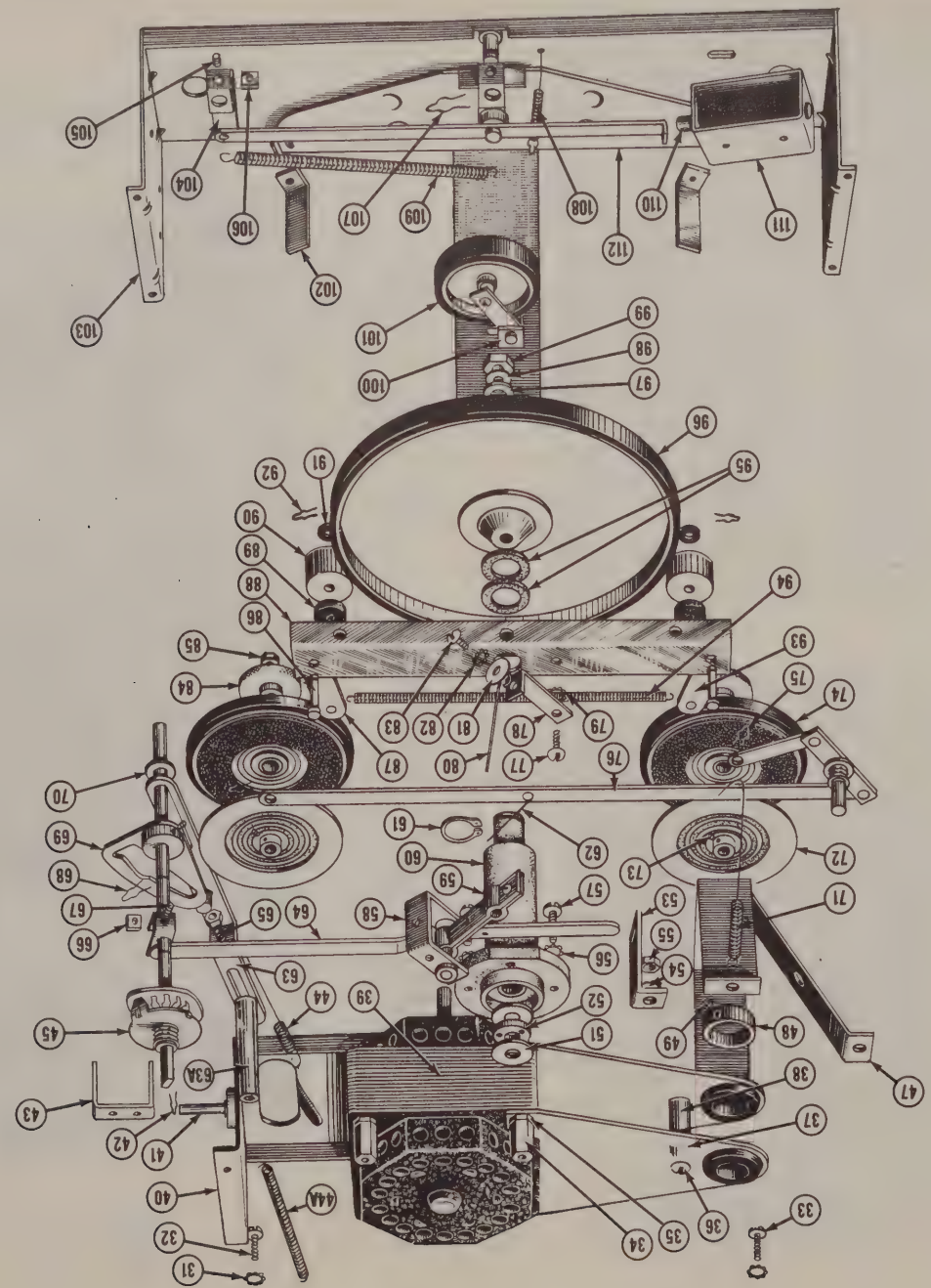
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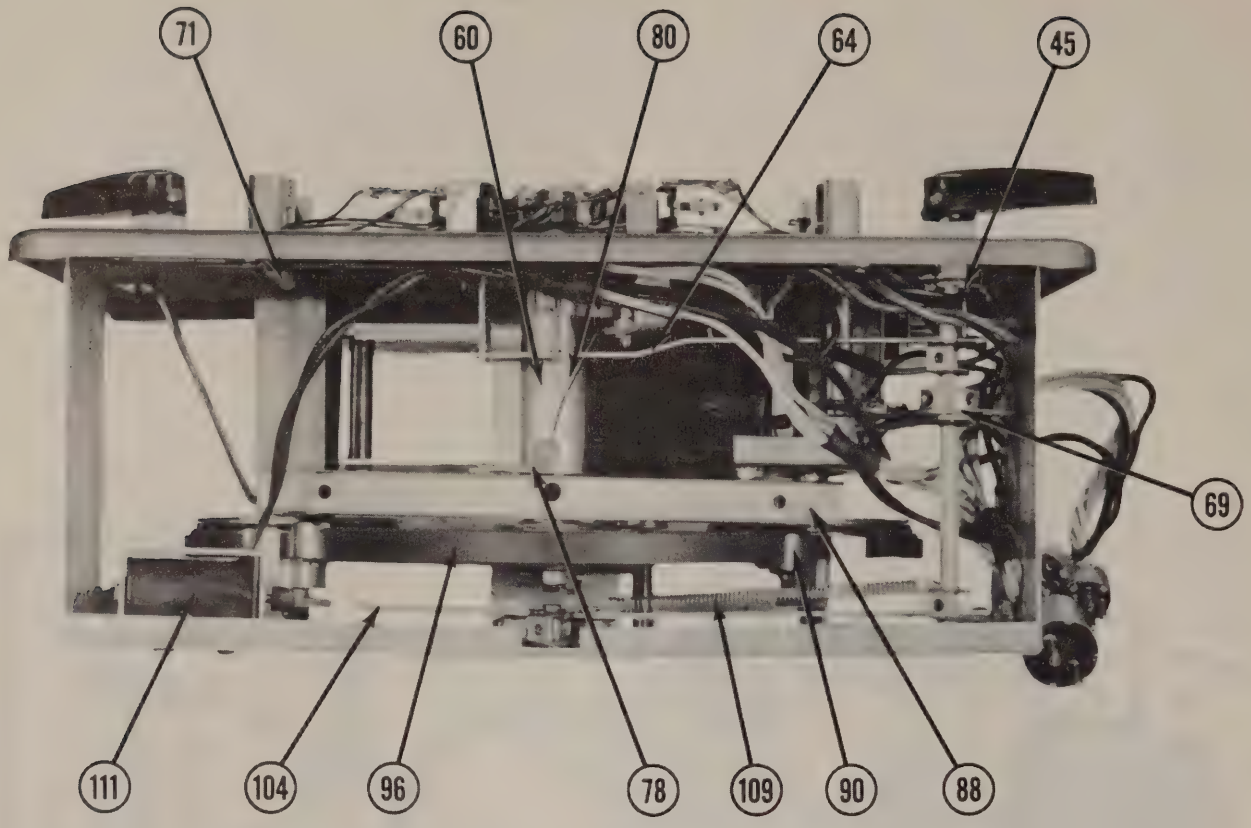

FIG. 5—FRONT SIDE VIEW

are adjusted by loosening their mounting screw (13B) and rotating pads to the correct position; then tighten the screw.

Automatic Reverse Adjustment:

The solenoid (111) should be adjusted so the machine will cycle automatically from forward to reverse every time the reversing switch (15) is actuated. To adjust the solenoid, remove the power plug, turn the control knob (16) to "Forward" position, and loosen the screws holding the solenoid bracket to the mounting base. Adjust the solenoid so that the rubber bumper on the solenoid plunger is approximately 1/32" from the tab on the end of the brake driving link; tighten the screws.

The spring (80) and bracket (78) must also be adjusted properly to assure definite reversing operation. The spring and bracket help to switch the oscillating bracket (88), which hold the self-energizing wheels (90) in contact with the clutch wheel (74). Adjust the spring so that it is vertical in respect to the head lifting link (64) when the machine is in the "Off" position.

TROUBLES

Failure to Reverse Automatically:

1. Check power source 6.3 volts by shorting the reversing switch (15). Short metal rings of the switch (15) and listen for hum in solenoid (111).
2. Excessive brake pressure. See "Brake Shoe Adjustment."
3. Solenoid out of adjustment, thereby not actuating the brake driving link (104). See "Automatic Reverse Adjustment."
4. Spring (80) broken or out of adjustment. See "Automatic Reverse Adjustment."
5. Check mechanism for binding parts.

Machine Shuts Off at End of Tape Instead of Reversing Operation:

1. Spring (44A) loose, thereby not pulling the motor and bracket assembly around, leaving the switch in the neutral or "Off" position.
2. Check for binding parts.
3. Check metallic coating on back of tape.

Speed Variation or "Wow":

1. Check the motor shaft and driving wheels (90) for oil and foreign material. Clean with carbon tetrachloride to remove oil.
2. Brake pressure adjustment too great. If this is true, the brake shoes may drag on the clutch wheels (74). See "Brake Shoe Adjustment."
3. Spring (108) loose, leaving the brake arm in a forward position. If this condition exists, it may allow the brake shoes to drag on the clutch wheels (74). It also prevents the machine from winding at high speed, producing a loud hum due to this drag.
4. Tape arm spring (71) loose. If this is true, the erase heads are not held in their play position, which results in the tape not being held in constant contact with the capstan (7).
5. Spring (80) loose; this, as a result, lessens the pressure of the self-energizing wheels (90) against the clutch wheels.

Failure to Erase:

1. Tape arm spring (71) loose. If this is true, the laminations of the erase heads will not be held in a positive position against the tape.
2. With the tape running in the "Forward" position, the top of the laminations on the right-hand erase head should be level with top edges of the tape. The top of the recording head laminations (25) should be 1/64" below the top of the tape.
3. With the tape running in the "Reverse" position, the bottom of the left-hand erase head laminations is level with the bottom of the tape. The recording head in "Reverse" position should be 1/64" above the lower edge of the tape.
4. Pressure pads (13) out of adjustment. See adjustment on "Pressure Pads."
5. Check resistance of erase head . . . should be approximately 80 ohms. Check voltage source.

Failure to Record:

1. Tape arm spring (71) loose . . . not holding recording head (25) against tape.

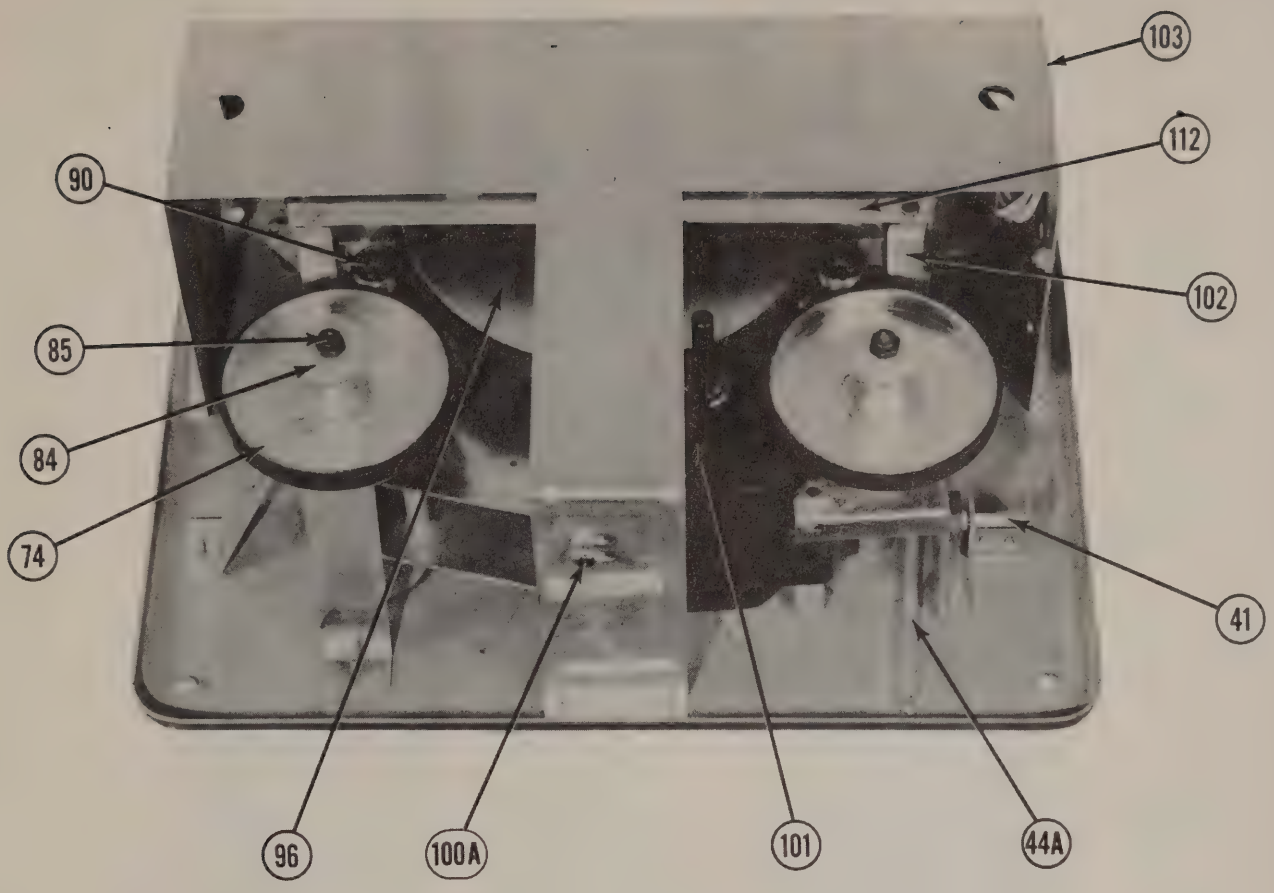

FIG. 6—BOTTOM VIEW

2. Spring of the recording head bracket and clamp assembly (58 and 59) broken.

3. Laminations on the recording head dirty. The laminations of the recording head (25) and the erase heads (24) are subject to an accumulation of tape coating residue, which is worn off as the tape passes. This must be periodically removed since it will cause distortion. This accumulation may be removed with carbon tetrachloride and a small cotton swab on the end of a toothpick. Be careful not to mar the laminations as they should be smooth to operate properly.

CAUTION: Do not adjust the recording head (25) since all adjustments are made by bending the tape arms, as described in "Tape Level Adjustment."

LUBRICATION

Lubrication applied at time of manufacture is sufficient for a long period of time; however, due to excessive use or high operating temperatures, lubrication should be applied in the following manner:

Use Sta-Put on the Following:

1. Fiber washer under reel platform.
2. Washers (51) and ball race (52) of the capstan shaft.
3. Cam roller and all sliding contact surfaces of the cam (69) and cam follower (63).
4. Sliding contact areas of the brake arm assembly and all movable link assemblies.
5. Head lifting link guide bracket (53).

Use Light Spindle Oil on the Following:

1. Head lifting bracket bearings (58).
2. Roller and shaft of the brake arm and roller assembly.
3. Felt pads (89) of the self-energizing idler wheels (90).

The felt pads on the clutch wheel face to be lubricated with powdered graphite.

CAUTION: Avoid overlubrication; this may cause parts to stick or failure of the machine to operate properly.

Do not oil the motor shaft or any of the rubber surfaces of the various wheels. Oil at these points may cause speed variation or "WOWS."

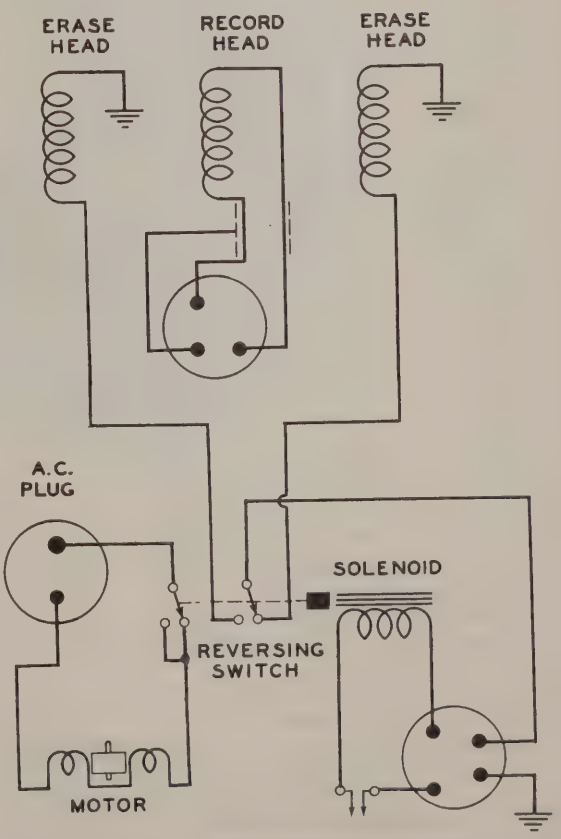

FIG. 7—WIRING DIAGRAM

PARTS LIST

Ref. No.	Part No.	DESCRIPTION
1	33-1042	Plug button—Bezel
2	1H10796FA7	Screw
3	25-1415	Rear bezel
4	25-1262	Reel retaining screw
5	27-1034	Reel shaft and platform assembly
6	21-1004	Reel shaft washer
7	27-1054	Capstan assembly
8	21-1003	Cork washer
9	1H10796FA7	Screw
10	25-1277	Front bezel
11	1H20525FA7	Screw
12	1H20525FA7	Screw
13	27-2088	Pressure pad assembly
13A	33-1034	Spacers
13B	1H20274FA1	Screws
14	1H20523FA7	Motor support bracket screws
15		Reversing switch assembly
15A	21-1053	Reversing switch base
15B	21-1054	Reversing switch post
15C	25-1420	Reversing switch washer
15D	21-1026	Reversing switch insulator
15E	33-1030	Reversing switch lug
16	21-1023	Control knob (knob purchased with two set screws in it)
17	25-1414	Guide post, left hand
18	21-1023	Control knob
19	25-1502	Nut
20	1H24520FA1	Lockwasher
21	27-1028	Motorboard assembly
22	27-1046-1	Left-hand tape arm assembly
23	27-1046	Right-hand tape arm assembly
24	43-1005	Right and left-hand erase head assembly
	2H10564	Screws for right-hand erase head
	1H24510FA1	Lockwashers right and left-hand erase heads
	2H10563	Screws left-hand erase head
25	27-1064	Recording head and platform assembly
26	25-1254	Capstan bearing housing ring
27	25-1474	Spacer for right-hand erase head
28	25-1502	Nut
29	1H24520FA1	Lockwasher
30	1H10245FA1	Screw
31	1H24256FA1	Lockwasher
32	1H10618FA1	Machine screw
33	1H10611FA1	Screw
34	25-1510	Shipping nut (part of motor assembly—item 39)
35	1H24258FA1	No. 10 lockwasher (part of motor assembly—item 39)
36	1H10646FA1	8-32 screw (part of motor assembly—item 39)
37	27-2103	Mounting plate assembly (part of motor assembly—item 39)
38	25-1401	Spacer (part of motor assembly—item 39)
39	27-2083	Motor assembly (including items 34, 35, 36, 37, 38, 40, 46, and 50)
40	25-1382	Mounting plate (part of motor assembly—item 39)
41		Motor support wheel and shaft assembly
	25-1385	Motor support wheel shaft
	27-1032	Motor support wheel
42	33-1002	Hairpin clip
43	25-1383	Motor support wheel bracket
44	33-1005	Cam spring
44A	33-1006	Motor spring
45	45-1005	Motor switch
46	1H24257FA1	No. 8 lockwasher (part of motor assembly—item 39)
47	27-1055	Reel shaft housing tripod
48	27-1031	Motor collar
49		Set screw (part of 48)
50	1H20519FA1	8-32 hex nut (part of motor assembly—item 39)
51	25-1409	Hardened bearing washers
52		Capstan thrust bearing
	21-1021	Bakelite retainer
	25-1410	Ball bearings
53	25-1423	Head lifting link guide bracket
54	1H24257FA1	Lockwasher
55	1H20248FA1	Nut
56	1H24256FA1	Lockwasher
57	1H10615FA1	Screw
58	27-2047	Head bracket and clamp assembly
59		Clamp (part of 59)
60	31-1008	Capstan bushing
61	33-1040	Truarc retaining ring
62		Head retracting spring
63	27-1058	Cam follower assembly
63A	25-1450	Cam follower guide post
64	27-1081	Head lifting link
65	1H42676FA1	Spade bolt
66	33-1032	Nut
67	1H25881FE26	Set screw
68	33-1004	Hairpin clip
69	27-2102	Cam
70	21-1004	Washer
71	33-1022	Tape arm spring
72	27-2107	Diaphragm and hub assembly
73	1H25848FE6	6-32 set screw
74	27-1025	Clutch wheel assembly
75	33-1002	Hairpin clip
76	27-1044	Tape arm link and spring assembly
77	1H21297FA1	Screw
78	25-1464	Oscillating bracket for vertical spring
79	1H24256FA1	Lockwasher
80	33-1020	Oscillating bracket return spring
81	1H52148FA1	Plain washer
82	1H24256FA1	Lockwasher
83	1H21297FA1	Screw
84	25-1407	Clutch adjusting nut
85	1H20752FA1	Locknut
86	25-1381	Self-energizing shaft
87	27-1047	Self-energizing bracket, right hand
88	25-1378	Oscillating bracket
89	21-1066	Felt washer (part of 27-1047)
90	27-1039	Self-energizing wheel (part of 27-1047)
91	21-1020	Felt washer (part of 27-1047)
92	33-1002	Hairpin clip (part of 27-1047)
93	27-1040	Self-energizing bracket, left hand (includes same as 27-1047 and should be serviced as one assembly)
94	33-1027	Spring
95	21-1003-1	Cork washers
96	27-1024	Main drive wheel assembly
97	1H52561FA1	Washer
98	1H24518FA1	Lockwasher
99	25-1509	Nut
100	25-1392	Bracket for idler wheel and bracket assembly
101	27-2086	Idler wheel and bracket assembly
102	27-1043	Brake arm assembly (part of 113)
103	27-2104	Brake arm support assembly
104	27-1042	Brake roller assembly
105	1H25849FE6	Set screw
106	33-1032	Nut
107	33-1004	Hairpin clip
108	33-1003	Brake spring
109	33-1046	Spring—auxiliary
110		Solenoid plunger and rubber cap
111		Solenoid
112	27-1043	Brake arm assembly (part of 103)

PHOTOFACT* Folder

JACKSON MODELS
5000, 5050, 5200, 5250, 5600, 5650

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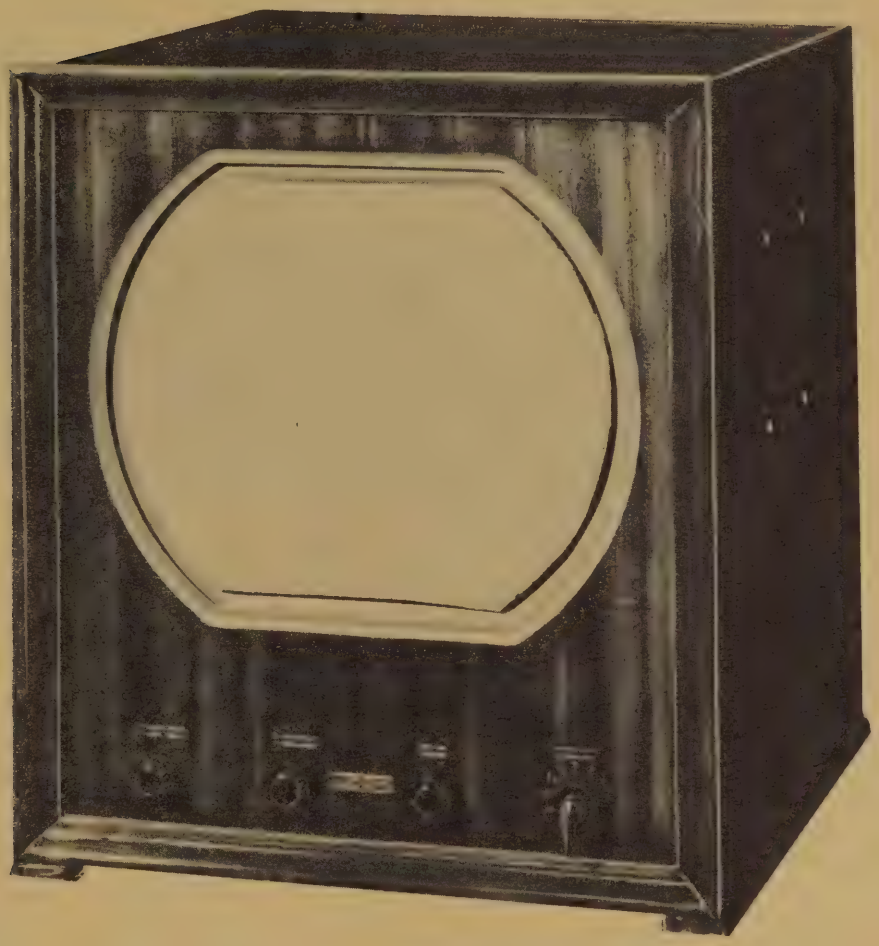

MODEL 5000

JACKSON MODELS
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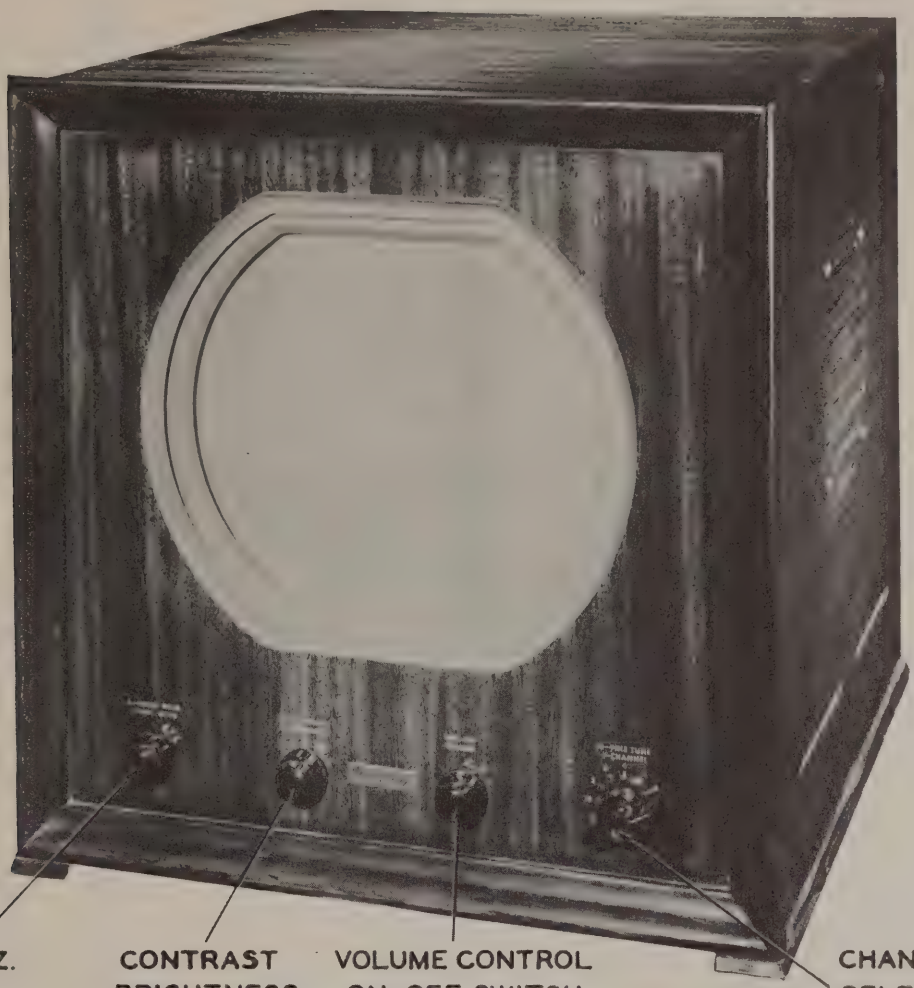

JACKSON MODELS 5000, 5050, 5200, 5250, 5600, 5650

JACKSON MODEL 5200

TRADE NAME	Jackson Models 5000, 5050, 5200, 5250, 5600, 5650
MANUFACTURER	Jackson Industries, Electronic Div., 58 E. Cullerton St., Chicago 16, Illinois
TYPE SET	Television Receiver
TUBES	Twenty One
POWER SUPPLY	110-120 Volts AC-60 Cycle — RATING 1.77 Amp. at 117 Volts AC
TUNING RANGE	Channels 2 thru 13

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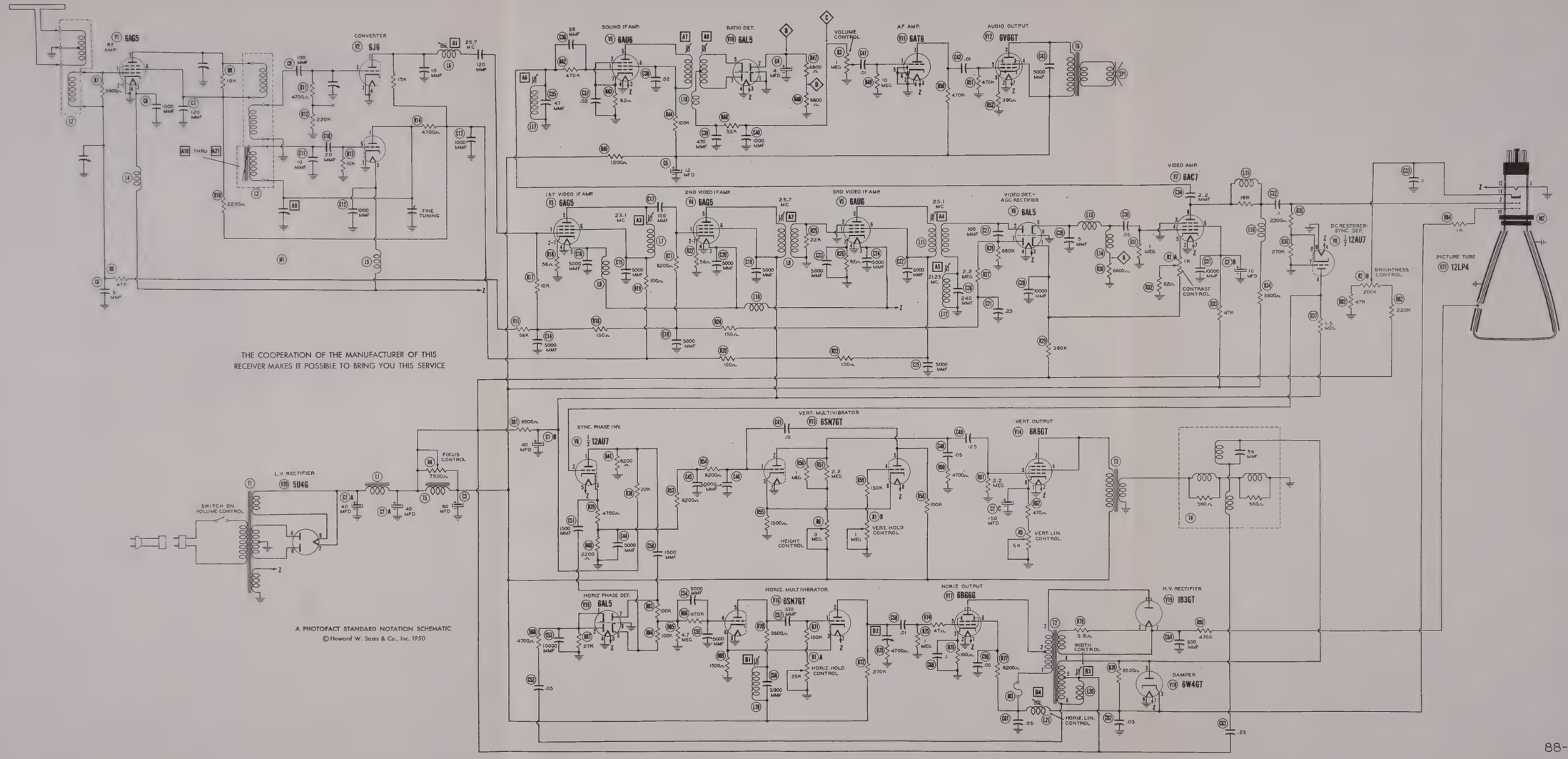

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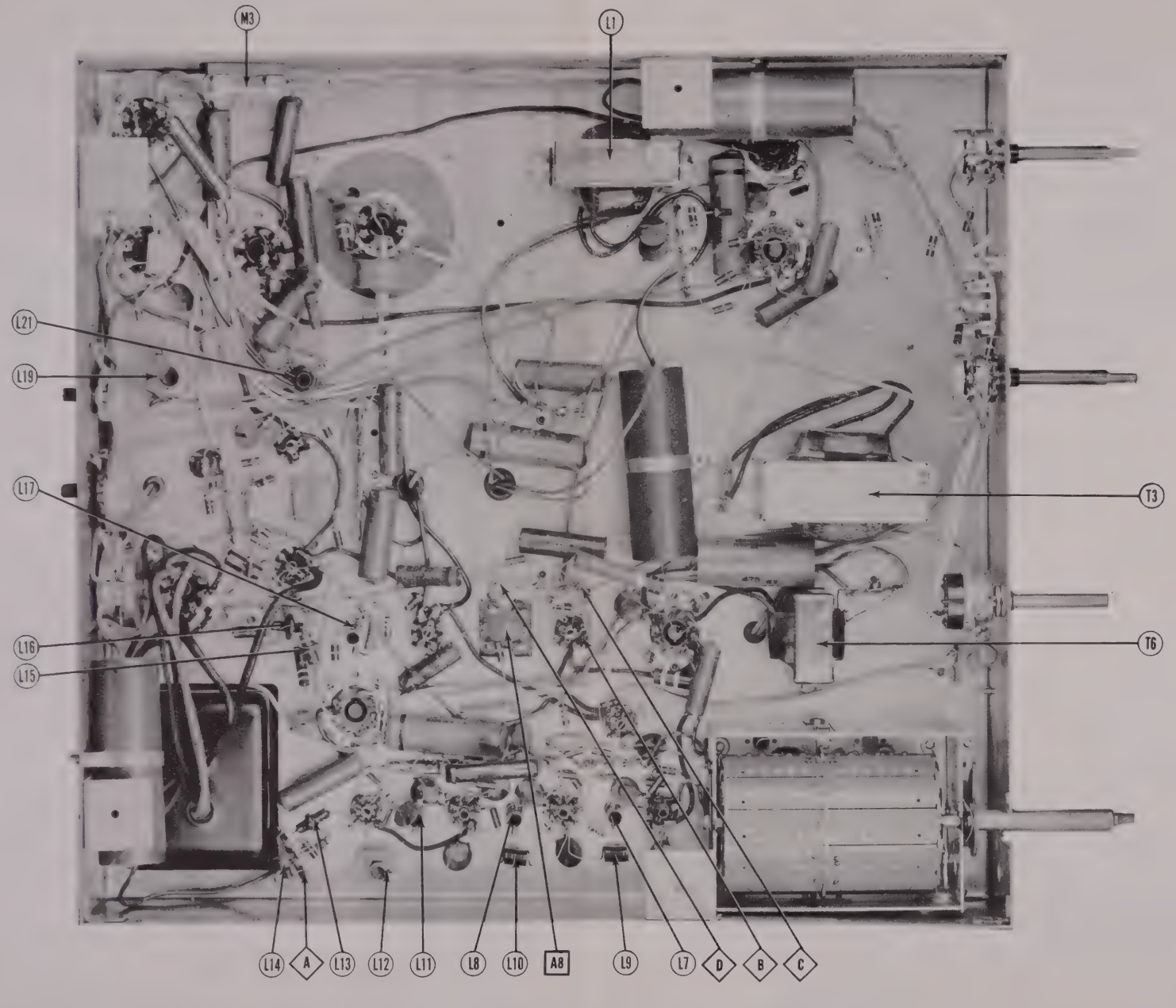
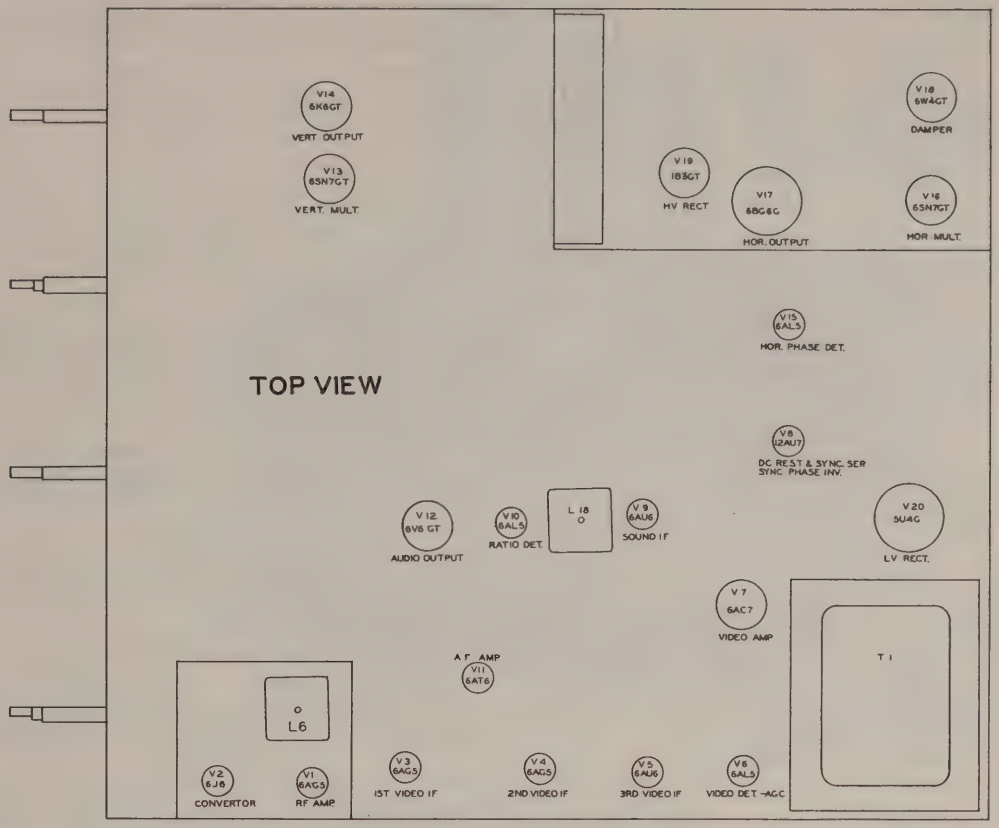
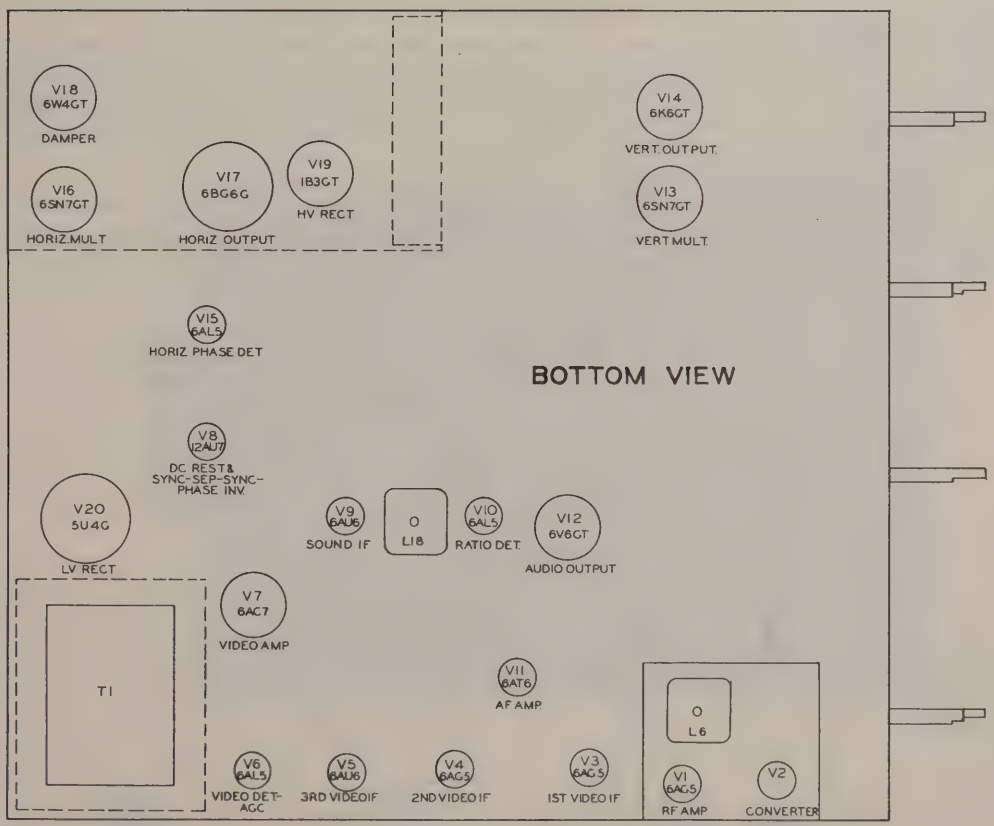
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To eliminate the high voltage shock hazard, unsolder one end of the high voltage fuse M3. Remove the horizontal oscillator tube (V16), to eliminate erratic scope indications.

VIDEO IF ALIGNMENT

Remove the channel 13 segment of the converter section on the tuner turret and turn the channel selector to channel 13 to disable the local oscillator.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over converter tube (V2). Low side to chassis.	25.7MC (Unmod.)	13 (see above)	DC Probe to Point (A) Common to chassis.	A1, A2	Adjust for maximum deflection.
2.	Direct	"	23.1MC	"	"	A3, A4	"
3.	Direct	"	21.25MC	"	"	A5	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Direct	High side to ungrounded tube shield floating over converter tube (V2). Low side to chassis.	23MC (10MC Sweep)	21.25MC 25.75MC	13	Vert. Amp. to Point (A) Low side to chassis.		Check for response curve similar to Fig 1 with markers as shown. If necessary retouch A1 thru A5 for optimum response. Recheck A5 if A4 is changed.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	.05MFD	High side to pin 4 (Grid) of 6AC7 (V7). Low side to chassis.	4.5MC (Unmod.)	Any channel not used locally)	DC Probe to Point (B) Common to chassis.	A6, A7	Adjust for maximum deflection.
6.	.05MFD	"	"	"	DC Probe to Point (C) Common to Point (D)	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ~ modulation and 450KC sweep. Use 120 ~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	.05MFD	High side to pin 4 (Grid) of 6AC7 (V7). Low side to chassis.	4.5MC (450KC Sweep)	4.5MC	Any channel not used locally	Vert. Amp. to Point (B) Low side to chassis.	A6, A7	Disconnect stabilizer capacitor C4. Adjust for maximum amplitude and symmetry as per Fig 2.
6.	.05MFD	"	"	"	"	Vert. Amp. to Point (C) Low side to chassis.	A8	Adjust A8 so 4.5MC occurs at center of crossover lines as per Fig 3. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Replace the channel 13 segment of the tuner turret.

The RF and converter adjustments are pre-set at the factory and are very stable. They will not normally require adjustment in the field. Complete oscillator alignment may not be necessary.

If all channels seem to be off frequency approximately the same amount it may be possible to correct them in one step using A9. It should be noted that this is an all channel oscillator circuit adjustment and should not be adjusted for any individual channel. If adjustment of A9 will not bring all channels within the range of the fine tuning control, it will be necessary to use the individual channel oscillator adjustment for each channel that is off frequency. The individual channel oscillator adjustments are reached through a hole just to the right of the channel selector shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.

Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. Amp. to Point (A) Low side to chassis.	A10	Adjust to place sound marker as shown in Fig 4. The video marker should be at 50%.
			207MC (10MC SWP)	205.25MC 209.75MC	12		A11	
			201MC (10MC SWP)	199.25MC 203.75MC	11		A12	
			195MC (10MC SWP)	193.25MC 197.75MC	10		A13	
			189MC (10MC SWP)	187.25MC 191.75MC	9		A14	
			183MC (10MC SWP)	181.25MC 185.75MC	8		A15	
			177MC (10MC SWP)	175.25MC 179.75MC	7		A16	
			85MC (10MC SWP)	83.25MC 87.75MC	6		A17	
			79MC (10MC SWP)	77.25MC 81.75MC	5		A18	
			69MC (10MC SWP)	67.25MC 71.75MC	4		A19	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A20	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A21	

FIG. 1

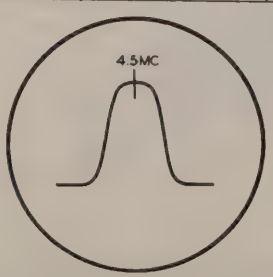


FIG. 2

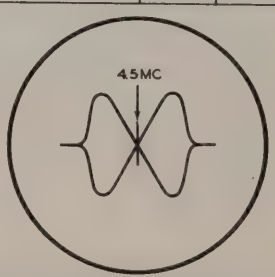


FIG. 3

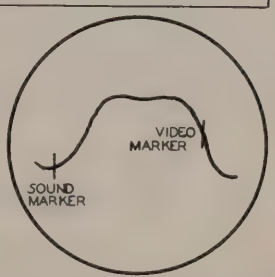
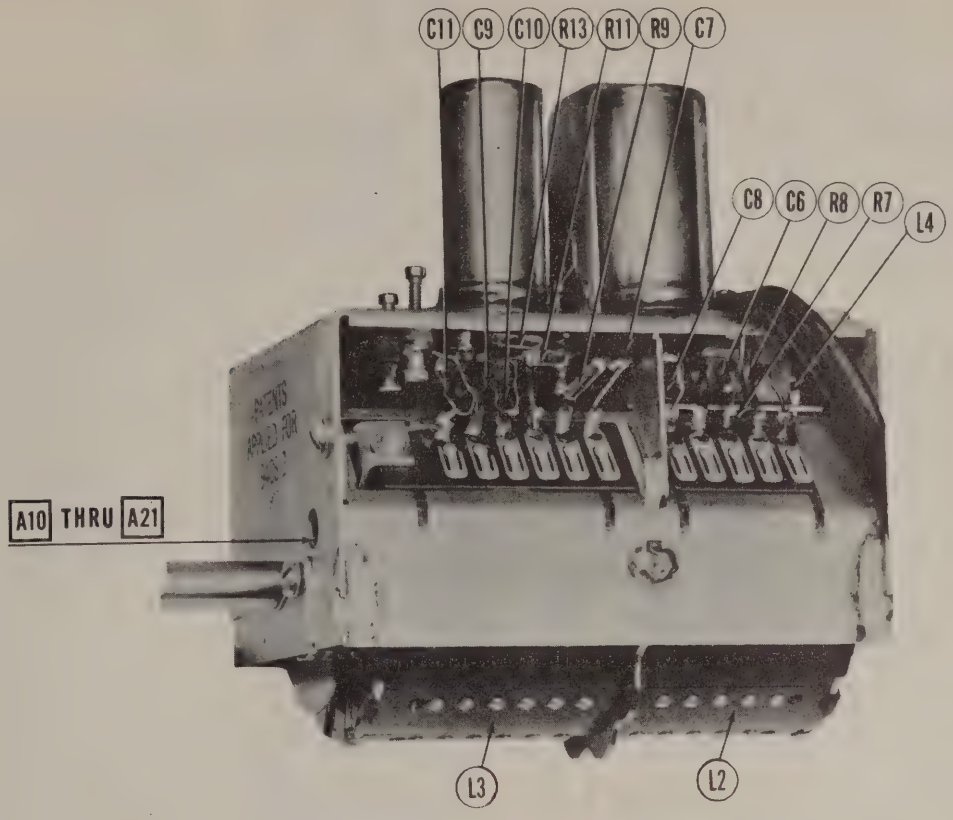
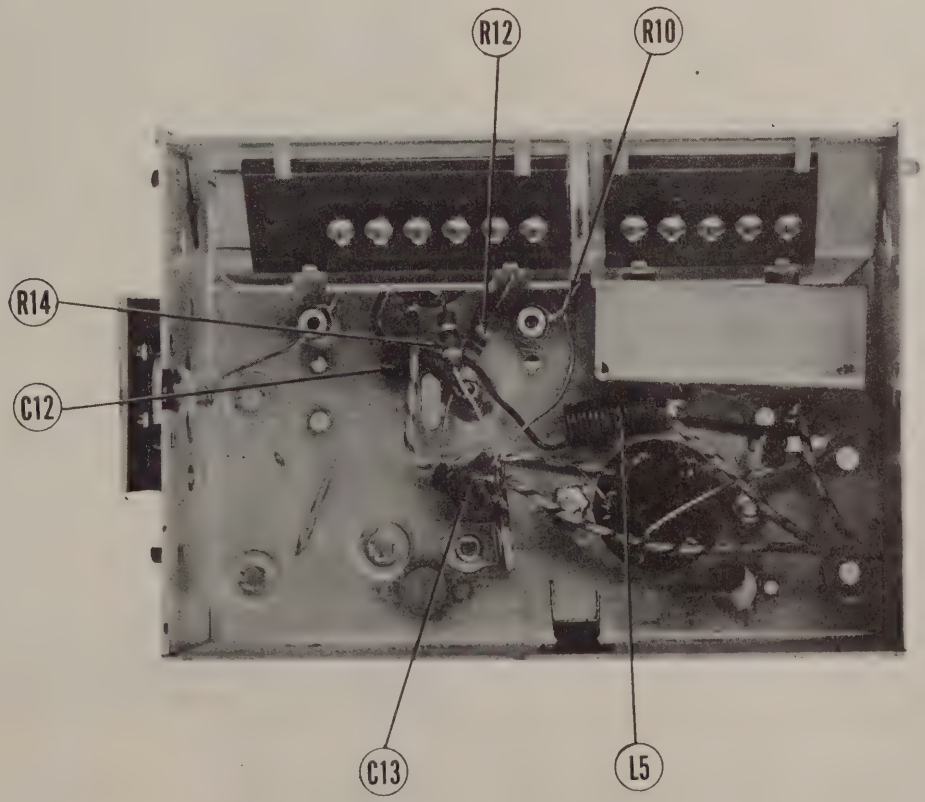


FIG. 4



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-.8VDC	0V.	6.3VAC	0V.	105VDC	105VDC	0V.		
V 2	6J6	65VDC	65VDC	6.3VAC	0V.	-1VDC	§-3VDC	0V.		
V 3	6AG5	-.2VDC	.3VDC	6.3VAC	0V.	115VDC	115VDC	.3VDC		
V 4	6AG5	-.3VDC	.4VDC	6.3VAC	0V.	115VDC	115VDC	.4VDC		
V 5	6AU6	0V.	0V.	6.3VAC	0V.	115VDC	115VDC	.9VDC		
V 6	6AL5	.5VDC	0V.	6.3VAC	0V.	.7VDC	0V.	-.4VDC		
V 7	6AC7	0V.	0V.	0V.	0V.	6.2VDC	280VDC	6.3VAC	290VDC	
V 8	12AU7	24VDC	8.3VDC	8.8VDC	6.3VAC	6.3VAC	8.3VDC	0V.	2.6VDC	0V.
V 9	6AU6	-.4VDC	.2VDC	6.3VAC	0V.	43VDC	43VDC	.2VDC		
V 10	6AL5	0V.	-.4VDC	6.3VAC	0V.	-.2VDC	0V.	-.2VDC		
V 11	6AT6	-.5VDC	0V.	6.3VAC	0V.	0V.	0V.	75VDC		
V 12	6V6GT	0V.	0V.	260VDC	270VDC	0V.	260VDC	6.3VAC	14VDC	
V 13	6SN7GT	-5.9VDC	55VDC	4.4VDC	3VDC	55VDC	4.4VDC	0V.	6.3VAC	
V 14	6K6GT	270VDC	6.3VAC	300VDC	310VDC	0V.	0V. 35VDC	0V.	12VDC 38VDC	
V 15	6AL5	0V.	0V.	6.3VAC	0V.	2.2VDC	0V.	-1.6VDC		
V 16	6SN7GT	-5.6VDC	105VDC	9VDC	-.1VDC	280VDC	9VDC	6.3VAC	0V.	
V 17	6BG6G	-6.4VDC	0V.	10VDC	470VDC	-6.4VDC	0V.	6.3VAC	300VDC	TOP CAP *
V 18	6W4GT	470VDC	0V.	470VDC	0V.	390VDC	0V.	0V.	6.3VAC	
V 19	1B3GT	* DO NOT MEASURE.								
V 20	5U4G	0V.	420VDC	0V.	385VAC	0V.	385VAC	0V.	420VDC	
V 21	12LP4	0V.	2.8VDC	PIN 10 460VDC	PIN 11 205VDC	PIN 12 6.3VAC				

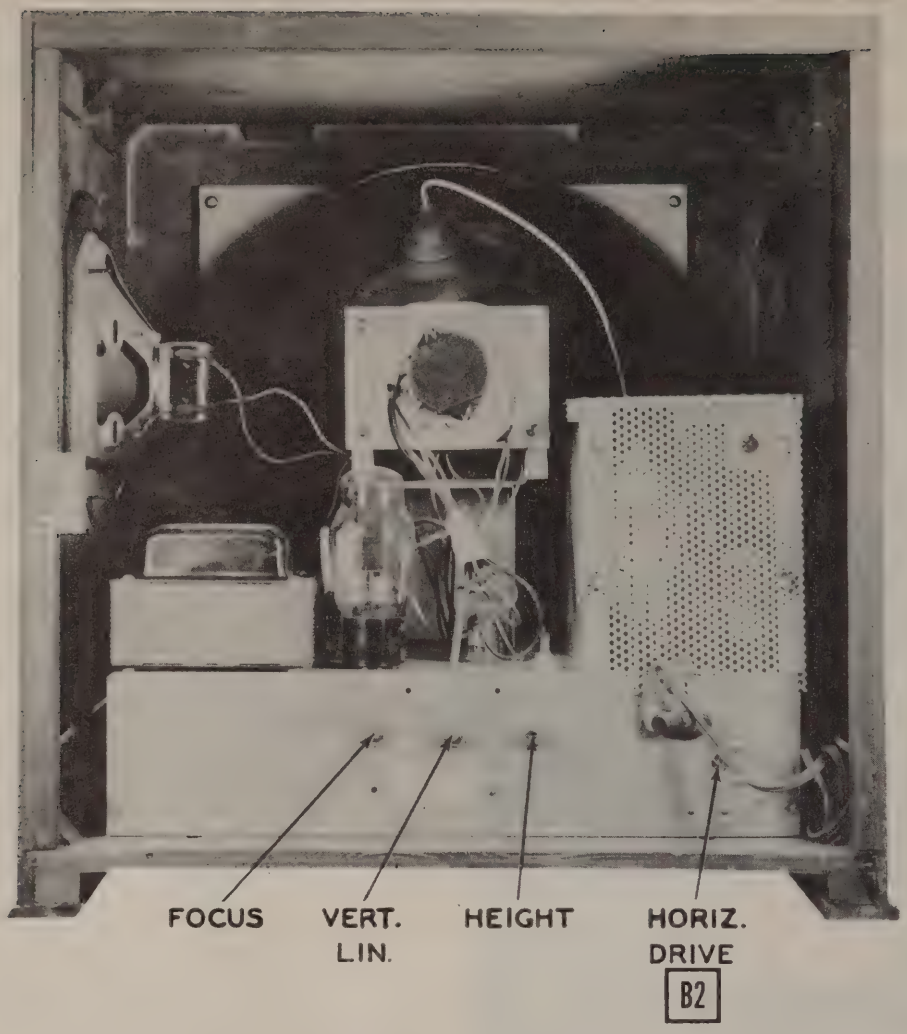
§ TAKEN WITH VACUUM TUBE VOLTMETER.
* DO NOT MEASURE.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	2.8 Meg.	0Ω	.1Ω	0Ω	†8KΩ	†8KΩ	0Ω		
V 2	6J6	†11KΩ	†21KΩ	.1Ω	0Ω	220KΩ	10KΩ	0Ω		
V 3	6AG5	2.8 Meg.	56Ω	.1Ω	0Ω	†6KΩ	†6KΩ	56Ω		
V 4	6AG5	2.8 Meg.	56Ω	.1Ω	0Ω	†6KΩ	†6KΩ	56Ω		
V 5	6AU6	.2Ω	0Ω	.1Ω	0Ω	†6KΩ	†6KΩ	82Ω		
V 6	6AL5	82Ω	.2Ω	.1Ω	0Ω	6.8KΩ	0Ω	680KΩ		
V 7	6AC7	0Ω	0Ω	0Ω	1 Meg.	1000Ω	†47KΩ	.1Ω	†6KΩ	
V 8	12AU7	†22KΩ	†1.5Meg.	6.9KΩ	.1Ω	.1Ω	†1.5Meg.	0Ω	270KΩ	0Ω
V 9	6AU6	470KΩ	82Ω	.1Ω	0Ω	†100KΩ	†100KΩ	82Ω		
V 10	6AL5	0Ω	13.5KΩ	1Ω	0Ω	1 Meg.	0Ω	1 Meg.		
V 11	6AT6	10 Meg.	0Ω	.1Ω	0Ω	0Ω	0Ω	470KΩ		
V 12	6V6GT	Inf.	0Ω	†2.9KΩ	†2.5KΩ	470KΩ	†2.5KΩ	.1Ω	390Ω	
V 13	6SN7GT	19KΩ	†3.8 Meg. †750KΩ	1.5KΩ	150KΩ	†100KΩ	1.5KΩ	0Ω	.1Ω	
V 14	6K6GT	†47KΩ	.1Ω	†2.2KΩ	†2.2KΩ	2.2 Meg.	5KΩ 0Ω	0Ω	5.5KΩ 500Ω	
V 15	6AL5	27KΩ	27KΩ	.1Ω	0Ω	4.8 Meg.	0Ω	4.8 Meg.		
V 16	6SN7GT	125KΩ	†270KΩ	1.5KΩ	5 Meg.	†6.5KΩ	1.5KΩ	.1Ω	0Ω	
V 17	6BG6G	1 Meg.	0Ω	100Ω	†8.5KΩ	1 Meg.	Inf.	.1Ω	†17KΩ	TOP CAP †8.5KΩ
V 18	6W4GT	†9.5KΩ	Inf.	†8.5KΩ	Inf.	†140Ω	Inf.	.1Ω	0Ω	
V 19	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP †8.5KΩ
V 20	5U4G	Inf.	30KΩ	Inf.	35Ω	Inf.	32Ω	Inf.	30KΩ	
V 21	12LP4	0Ω	270KΩ	PIN 10 †10KΩ	PIN 11 100KΩ	PIN 12 .1Ω				

† MEASURED FROM PIN 2 OF V20.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



CABINET-REAR VIEW

HORIZONTAL OSCILLATOR ADJUSTMENT

Turn the set on and tune in a TV station, preferably a test pattern. Turn the vertical hold control to synchronize the picture vertically.

Turn the horizontal hold control to the mid-position of its range.

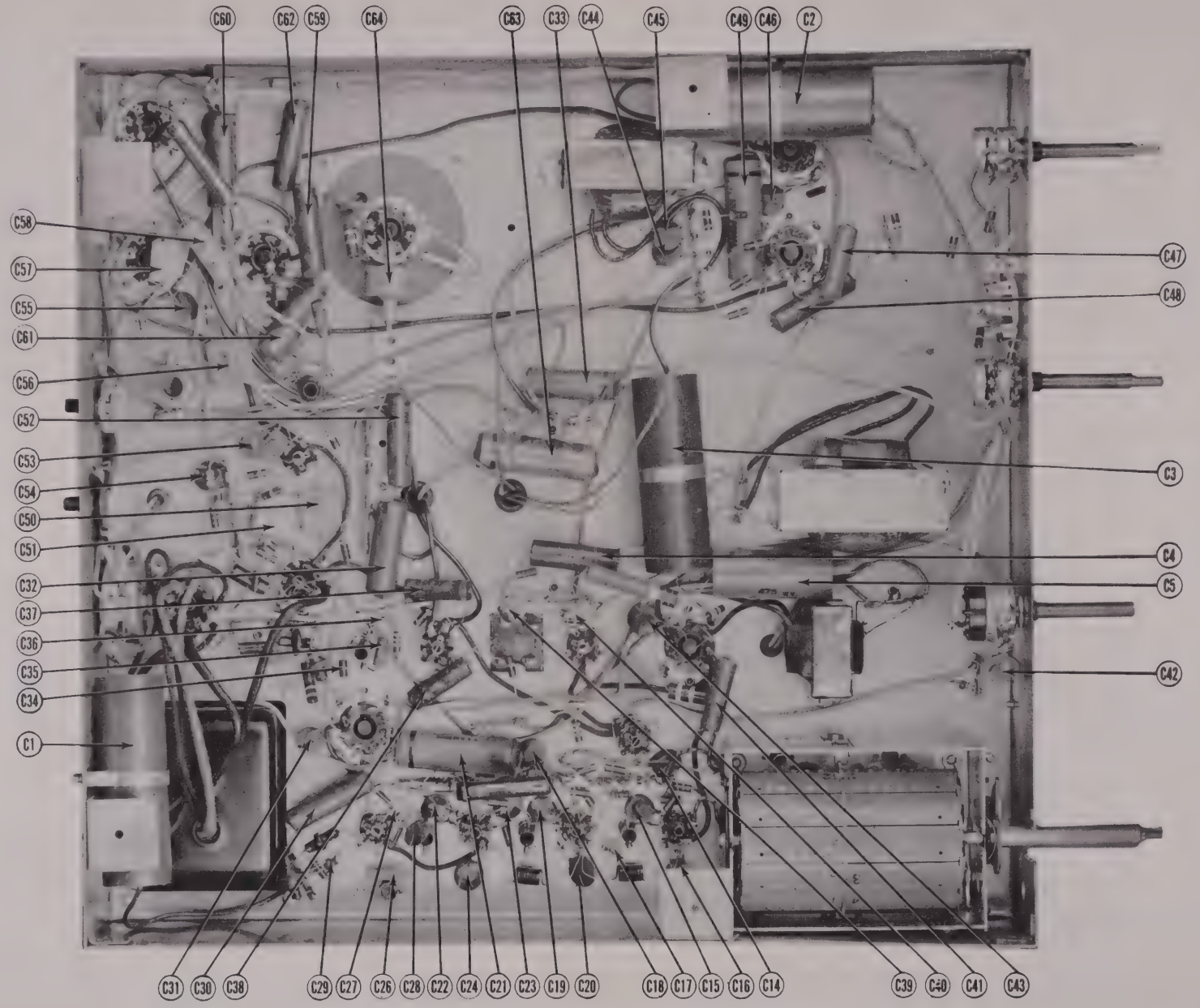
Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Turn the horizontal drive trimmer (B2) clockwise as far as possible without crowding the right side of the picture.

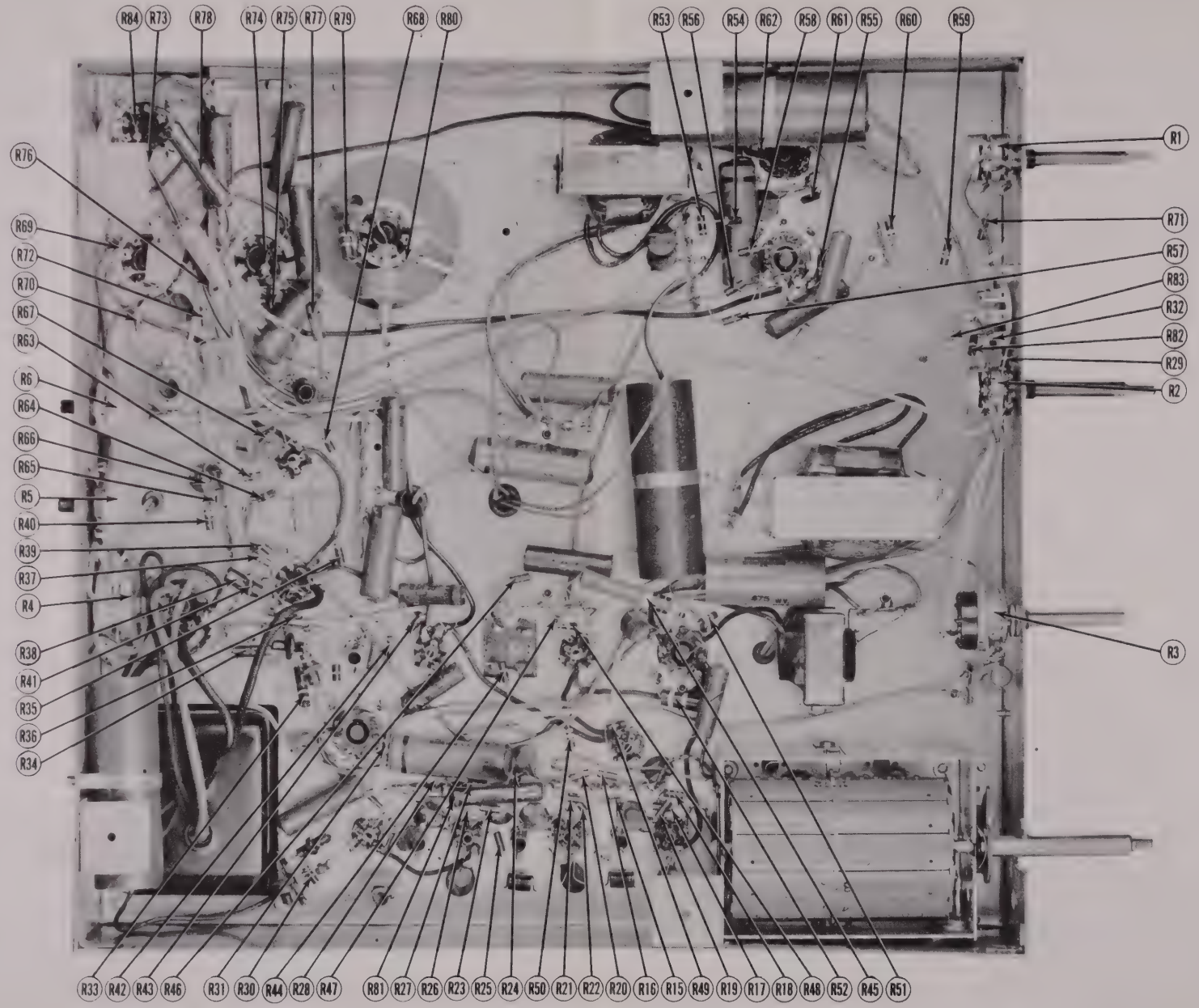
Adjust the width slug (B3) until the picture fills the mask horizontally. Adjust the horizontal linearity slug (B4) until picture is symmetrical from left to right. Readjustment of B2 may be necessary to obtain optimum results.

DISASSEMBLY INSTRUCTIONS

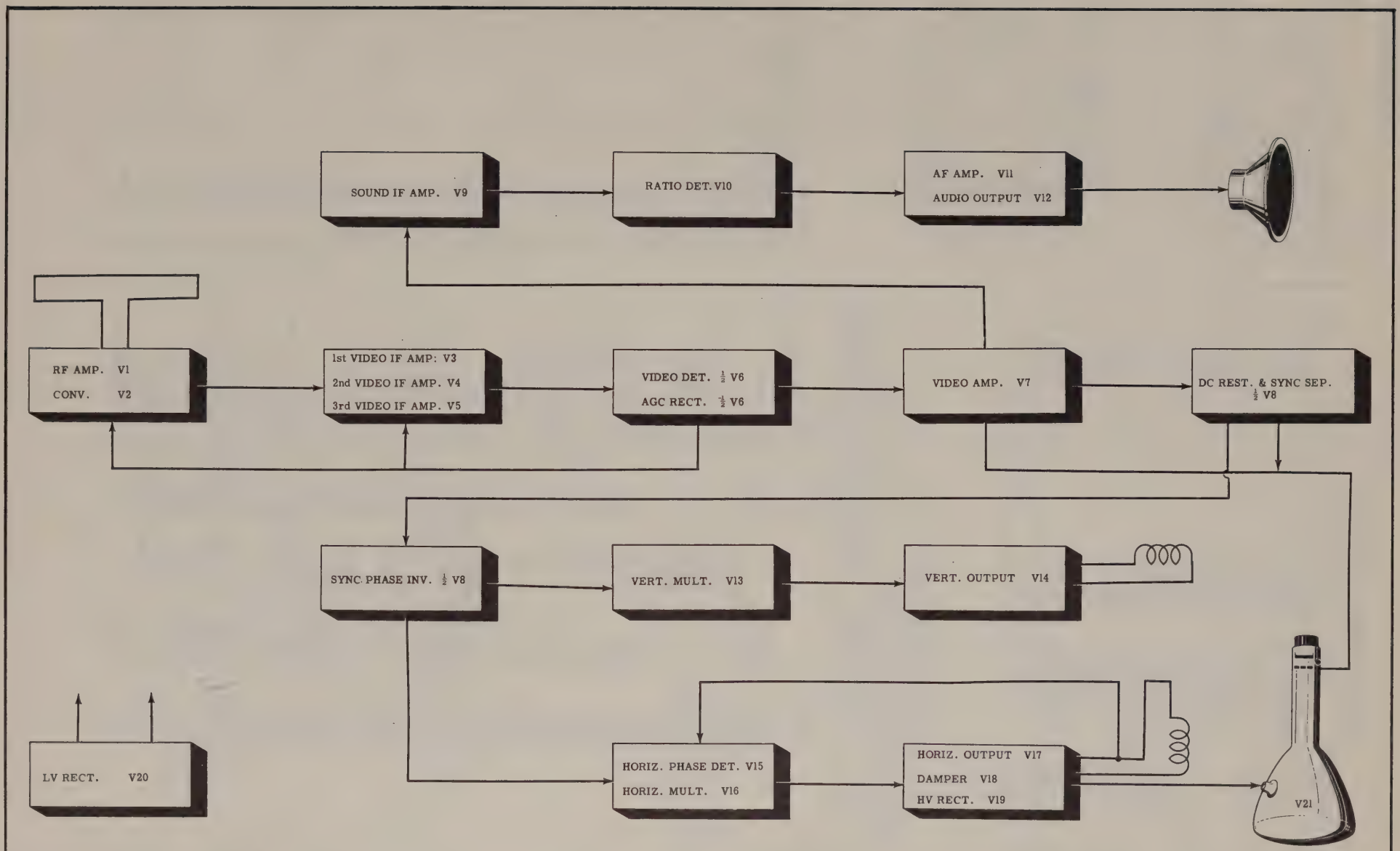
1. Remove four push-on type control knobs.
2. Remove twelve phillips head screws holding rear cover. Remove cover.
3. Loosen two phillips-head screws holding antenna terminal strip. Free strip.
4. Remove two speaker jacks from speaker.
5. Remove four screws holding chassis. Remove chassis.
6. Remove four 5/16" hex nuts holding speaker. Remove speaker.



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



BLOCK DIAGRAM

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: JACKSON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.		6AG5	7BD	
V2	Converter		6J6	7BF	
V3	1st Video IF		6AG5	7BD	
V4	2nd Video IF		6AG5	7BD	
V5	3rd Video IF		6AU6	7BK	
V6	Video Det. - AGC Rectifier		6AL5	6BT	
V7	Video Amp.		6AC7	8N	
V8	DC Restorer-Sync. Sep.-Phase Inv.		12AU7	9A	
V9	Sound IF Amp.		6AU6	7BK	
V10	Ratio Det.		6AL5	6BT	
V11	AF Amp.		6AT6	7BT	
V12	Audio Output		6V6GT	7AC	
V13	Vert. Multivib.		6SN7GT	8BD	
V14	Vert. Output		6K6GT	7S	
V15	Hor. Phase Det.		6AL5	6BT	
V16	Hor. Multivib.		6SN7GT	8BD	
V17	Hor. Output		6BG6G	5BT	
V18	Damper		6W4GT	4CG	
V19	HV Rectifier		1B3GT	3C	
V20	LV Rectifier		5U4G	5T	
V21A	Picture Tube		12LP4	12D	
B	Picture Tube		10BP4	12D	
C	Picture Tube		16AP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: JACKSON PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450		PRSA450/40-40	EDJ10118		TVL-64 §	Filter-Red
B	40	450						Filter-Red
C2A	40	450		PRS450/40-20			TVL-29†	Filter-Red
B	10	450		PRS50/100			TVA-17§	V. Amp. Screen Bypass Blue
C	150	50						Vert. Output Cath. Byp. Green
C3	80	450		PRSA450/40-40†	EZ10074		TVL-9§	Filter
C4	4	50		PRS50/4	BR550		TVA-13	Stabilizing Cap.
C5	12	475		PRS500/12	BR650A		TVA-21	Decoupling
C6	5			C15CNPO		NPOK-5		Fixed Trimmer
C7	120			GP120M		GP2K-120		RF Decoupling
C8	1000			GP1000M		GP2L-001		RF Filament Bypass
C9	100			GP100M		GP1K-100		RF Coupling
C10	20			C20JNPO		NPOK-20		Osc. Grid Cap.
C11	10			C10JN750		N750K-10		Fixed Trimmer
C12	1000			GP1000M		GP2L-001		Conv. Filament Bypass
C13	1000			GP1000M		GP2L-001		RF Bypass
C14	5000			BPD-5	1D5D5	811-005	29C1	AGC Filter
C15	5000			BPD-5	1D5D5	811-005	29C1	1st V. IF Decoupling
C16	5000			BPD-5	1D5D5	811-005	29C1	1st V. IF Fil. Bypass *
C17	100			GP100M	5W5T1	GP1K-100	1FM-31	IF Coupling
C18	5000			BPD-5	1D5D5	811-005	29C1	AGC Filter
C19	5000			BPD-5	1D5D5	811-005	29C1	2nd V. IF Decoupling
C20	5000			BPD-5	1D5D5	811-005	29C1	2nd V. IF Fil. Bypass *
C21	25	400		P488-25	GT4P25		TC-2	AGC Filter
C22	5000			BPD-5	1D5D5	811-005	29C1	3rd V. IF Decoupling
C23	5000			BPD-5	1D5D5	811-005	29C1	3rd V. IF Cath. Bypass
C24	5000			BPD-5	1D5D5	811-005	29C1	3rd V. IF Fil. Bypass *
C25	5000			BPD-5	1D5D5	811-005	29C1	3rd V. IF Decoupling
C26	240	500		[illegible]	5R5T25		MS-325	Fixed Trimmer
C27	100			GP100M	5W5T1	GP1K-100	1FM-31	IF Coupling
C28	10000			BPD-10	PTE4S1	821-01	36C1	Decoupling *
C29	5			C5CK	5W5V5	NPOK-5	MS-55	V. Diode Filter
C30	.05	400		P68-05	PTE6S5		TM-15	Video Coupling
C31	10000			BPD-10	PTE4S1	821-01	36C1	V. Amp. Screen Bypass
C32	.1	400		P488-1	PTE4P1		TM-1	Video Coupling
C33	.1	400		P488-1	PTE4P1		TM-1	Pic. Tube Cath. Dec.
C34	2.2							S. IF Coupling
C35	47			CN47JN750	5R5Q5	N750L-47	MS-45	Fixed Trimmer
C36	39			GP39M	5W5Q4	GP1K-39	1FM-44	S. IF Coupling
C37	.02	400		P488-02	PTE4S2		TM-12	S. IF Cathode Bypass
C38	02	400		P488-02	PTE4S2		TM-12	S. IF Decoupling
C39	470			GP470M	5W5T5	GP2K-470	1FM-35	Diode Load Cap.
C40	1000			GP1000M	1W5D1	GP2L-001	1FM-21	De-emphasis †
C41	.01	400		P488-01	PTE4S1	821-01	TM-11	Audio Coupling
C42	.01	400		P488-01	PTE4S1	821-01	TM-11	Audio Coupling
C43	5000			BPD-5	1D5D5	811-005	29C1	Output Plate Bypass
C44	5000			BPD-5	1D5D5	811-005	29C1	Sync. Sep. Cathode Bypass
C45	5000			BPD-5	1D5D5	811-005	29C1	Integrator Net.
C46	5000			BPD-5	1D5D5	811-005	29C1	Integrator Net.
C47	.01	400		P488-01	PTE4S1	821-01	TM-11	Vert. MV Feedback
C48	.05	400		P488-05	PTE4S5		TM-15	Vert. Discharge
C49	.25	400		P488-25	GT4P25		TC-2	Vert. Sweep Coupling
C50	1500	500		1467-0015	1W5D15	GP2L-0015	1FM-215	Hor. Sync. Coupling
C51	1500	500		1467-0015	1W5D15	GP2L-0015	1FM-215	Hor. Sync. Coupling
C52	.05	400		P488-05	PTE4S5		TM-15	Hor. Feedback
C53	10000			BPD-10	PTE6S1	821-01	36C1	Integrator Net.
C54	5000			BPD-5	1D5D5	811-005	29C1	AFC Filter
C55	5000			BPD-5	1D5D5	811-005	29C1	AFC Filter
C56	3900	500						Fixed Trimmer
C57	330	500		1453-3301	5W5T3	GP2K-330	1FM-335	Hor. MV Feedback
C58	.01	600		P668-01	PTE6S1	821-01	TM-11	Hor. Sweep Coupling
C59	.05	400		P488-5	PTE4S5		TM-15	Hor. Output Screen Bypass

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: JACKSON PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C60	1	400		P488-1	PTE4P1		TM-1	Hor. Output Cath. Bypass
C61	.05	600		P688-05	PTE6S5		TM-15	Damper Filter
C62	.03	600		P688-03	PTE6S3		TM-13	Damper Filter
C63	.25	400		P488-25	GT4P25		TC-2	Hor. Sweep Coupling
C64	500	10000						HV Filter

* Not used in all models.
† Some models use 2000MMF in this application.
‡ Parallel sections to obtain desired capacity.
§ Use mounting strap.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: JACKSON PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	INSTALLATION NOTES
R1A	25KΩ			B11-120 *		Horiz. hold control, panel
B	1 Meg.			B11-137 *		Vert. hold control, rear
C	Shaft End			E202 *		Attach per instructions in "Concentrikit".
R2A	1000Ω					Contrast control
B	200KΩ			Q13-137	M-63-Z	Brightness control
R3A	1 Meg.			Q13-137	M-63-Z	Volume control
B	Switch			76-1	SW-A	Attach to R3A per instructions
R4	7500Ω	2			58-7500 #	Focus control, Wire Wound
R5	5000Ω	2		W-5000#	43-5000#	Vert. linearity control, Wire Wound
R6A	3 Meg.			Q11-140		Height control
B	Shaft			RQ		Attach to R6A per instructions

* Additional parts to be used with "Concentrikit".
# File slot in shaft to duplicate original.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: JACKSON PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 20% UNLESS OTHERWISE STATED.
R7	3900Ω 10%			BTS-3900	RF Grid
R8	47KΩ				AGC Network
R9	10KΩ 10%			BTS-10K	RF Plate Coil Shunt
R10	2200Ω			BTS-2200	RF Decoupling
R11	4700Ω 10%			BTS-4700	Mixer Grid
R12	220KΩ			BTS-220K	Mixer Grid
R13	10KΩ 10%			BTS-10K	Osc. Grid
R14	4700Ω 10%			BTS-4700	Osc. Plate
R15	56KΩ 5%			BTS-5600-5%	AGC Network
R16	150Ω				AGC Network
R17	10KΩ				1st Video IF Grid
R18	56Ω				1st Video IF Cathode
R19	100Ω				1st Video IF Decoupling
R20	100Ω				Decoupling
R21	8200Ω				2nd Video IF Grid
R22	56Ω				2nd Video IF Cathode
R23	100Ω				Decoupling
R24	150Ω				AGC Network
R25	22KΩ				3rd Video IF Transformer Shunt
R26	82Ω				3rd Video IF Cathode
R27	2.2 Meg.			BTS-2.2 Meg.	AGC Network
R28	680KΩ			BTS-680K	AGC Rect. Diode Load
R29	390KΩ			BTS-390K	Voltage Divider
R30	6800Ω			BTS-6800	Video Det. Diode Load
R31	1 Meg.			BTS-1 Meg.	Video Amp. Grid
R32	82Ω 10%				Video Amp. Cathode
R33	47KΩ	1		BTA-47K	Video Amp. Screen
R34	5600Ω	1		BTA-5600	Video Amp. Plate
R35	2200Ω			BTS-2200	Picture Tube Grid
R36	270KΩ			BTS-270K	DC Rest. Load
R37	1.5 Meg.			BTS-1.5 Meg.	Sync. Phase Inv. Grid
R38	22KΩ	2		BT-2-22K	Sync. Phase Inv. Plate
R39	4700Ω			BTS-4700	Sync. Phase Inv. Cathode
R40	2200Ω			BTS-2200	Sync. Phase Inv. Cathode
R41	8200Ω			BTS-8200	Voltage Divider
R42	470KΩ				Sound IF Grid
R43	82Ω				Sound IF Cathode
R44	100KΩ			BTS-100K	Sound IF Decoupling
R45	1200Ω 10%			BT-2-1200	Decoupling - See note 1.
R46	33KΩ			BTS-33K	De-emphasis
R47	6800Ω 10%			BTS-6800	Ratio Det. Diode Load
R48	6800Ω 10%			BTS-6800	Ratio Det. Diode Load
R49	10 Meg.			BTS-10 Meg.	AF Grid
R50	470KΩ			BTS-470K	AF Plate
R51	470KΩ			BTS-470K	Output Grid
R52	390Ω 10%	2		BW-2-390	Output Cathode
R53	820Ω			BTS-8200	Integrator
R54	8200Ω			BTS-8200	Integrator
R55	1500Ω			BTS-1500	Vert. MV Cathode
R56	1 Meg.			BTS-1 Meg.	Vert. MV Plate
R57	2.2 Meg.			BTS-2.2 Meg.	Vert. MV Plate See Note 2
R58	100KΩ			BTS-100K	Vert. MV Plate
R59	150KΩ			BTS-150K	Vert. MV Grid
R60	4700Ω			BTS-4700	Vert. Peaking
R61	2.2 Meg.			BTS-2.2 Meg.	Vert. Output Grid
R62	470Ω			BTS-470	Vert. Output Cathode

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: JACKSON PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R63	100KΩ			BTS-100K	Horiz. Phase Det. Load
R64	100KΩ			BTS-100K	Horiz. Phase Det. Load
R65	4.7 Meg.			BTS-4.7 Meg.	Horiz. Phase Det. Load
R66	470KΩ			BTS-470K	Horiz. AFC Filter Network
R67	27KΩ 10%			BTS-27K	Feedback Network
R68	4700Ω			BTS-4700	Feedback Network
R69	1500Ω			BTS-1500	Horiz. MV Cathode
R70	5600Ω			BTS-5600	Horiz. MV Plate
R71	100KΩ			BTS-100K	Horiz. MV Grid
R72	270KΩ			BTS-270K	Horiz. MV Plate
R73	4700Ω			BTS-4700	Horiz. Peaking
R74	47Ω				Parasitic Supp.
R75	1 Meg.			BTS-1 Meg.	Horiz. Output Grid
R76	100Ω	2		BW-2-100	Horiz. Output Cathode See Note 3
R77	8200Ω	2		BT-2-8200	Horiz. Output Screen
R78	8500Ω	10		AB-8500	Damper Filter-Wire Wound
R79	3.9Ω	1			HV Rect. Filament
R80	470KΩ	½			HV Filter
R81	6500Ω	10			Filter-Wire Wound
R82	220KΩ	½		BTS-220K	Voltage Divider
R83	47KΩ	½		BTS-47K	Voltage Divider
R84	1000Ω	½		BTS-1000	Acc. Anode Decoupling See Note 2

Note 1. Some models use 1000Ω resistor in this application.
Note 2. Not used in all models.
Note 3. Some models use 82Ω, 2 watt resistor in this application

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: JACKSON PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC at 1.77A	750VCT .200ADC	5VAC at 3A	6.3VAC at 8.7A		P-8154 and P-5014 ②		

② Mount series filament transformer above chassis.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: JACKSON PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	NOTES
T2	485Ω Tap at 165Ω	SEC. 1 11.6Ω Tap. at .6Ω SEC. 2 0Ω		A-8117	HVO-3	TFB-2	Hor. Output Trans.
T3	1250Ω	9.5Ω		A-8112	A-3035 ②	TSO-5	Vert. Output Trans.
T4A	13.5Ω			DY-1	MD-1		Hor. Deflection Coil
B	64Ω						Vert. Deflection Coil
T5	165Ω						Focus Coil

② Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: JACKSON PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T6	5.2KΩ	3.5Ω	400Ω	.8Ω		A-3877	A-2930	RO-9①	①Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: FIELD RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: JACKSON PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1	PM	3.5Ω		ST-117 MOD. P8-T	8A21	
	CONE DIA.	V. C. DIA.				
SP2	7 1/4"	1"				

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

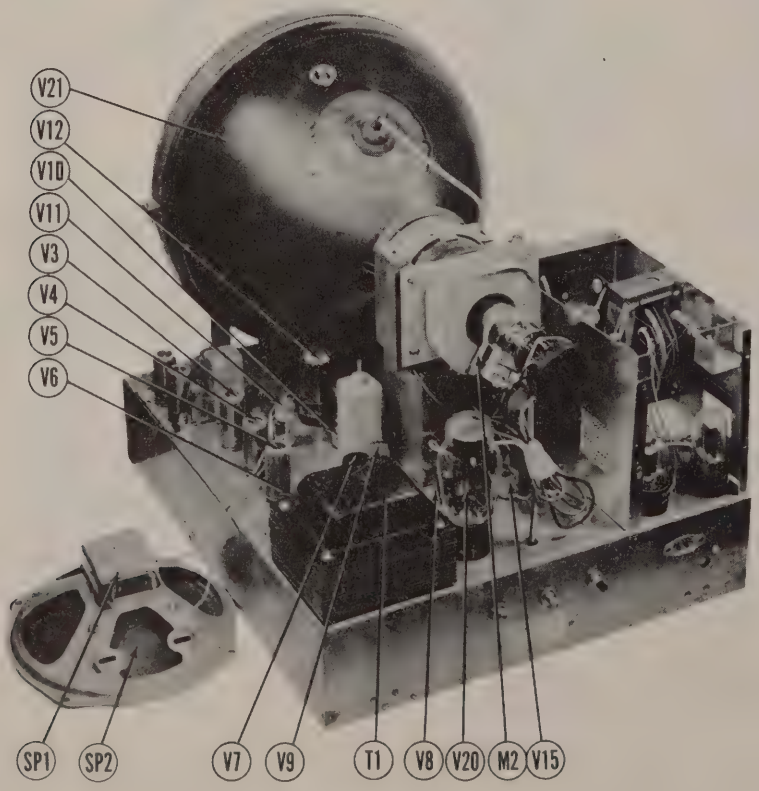
ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	JACKSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.200A	145Ω	8.2 Henries		C-2325 ①	C-2991 ①	TR-4200 ①	① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	JACKSON PART No.	MEISSNER PART No.	
L2	Ant. Strip	0Ω				
L3	RF, Mixer and Osc. Strip	0Ω				
L4	Fil. Choke	0Ω				
L5	Fil. Choke	0Ω				
L6	1st Video IF	.2Ω				
L7	2nd Video IF	.2Ω				
L8	3rd Video IF	.2Ω				
L9	Fil. Choke	0Ω				
L10	Fil. Choke	0Ω				
L11	4th Video IF	.2Ω				
L12	Sound Trap	0Ω				
L13	Peaking	7Ω				120 microhenries
L14	Peaking	19Ω				600 microhenries
L15	Peaking	10.5Ω				240 microhenries. Wound on 18KΩ resistor.
L16	Peaking	14Ω				380 microhenries.
L17	Sound IF	1.6Ω				
L18	Ratio Det. Trans.	4Ω	.2Ω			
L19	Hor. Osc. Cont.	90Ω				
L20	Width Cont.	.2Ω				
L21	Hor. Linearity	32Ω				

MISCELLANEOUS

ITEM No.	PART NAME	JACKSON PART No.	NOTES
M1	RF Tuner		
M2	Ion Trap		
M3	Fuse		.25A, 250V



CHASSIS–TOP VIEW

KNIGHT
MODEL 4G420

KNIGHT
MODEL 4G420

KNIGHT MODEL 4G420

TRADE NAME	Knight, Model 4G420
SUPPLIER	Allied Radio Corp., 833 W. Jackson Blvd., Chicago 7, Illinois
TYPE SET	AC Operated Combination Phono-Radio, Superheterodyne Receiver
TUBES (FOUR)	Types 12SA7 Converter, 12SQ7 DET-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier
POWER SUPPLY	110-125 Volts AC — RATING .23 Amp at 117 Volts AC
TUNING RANGE—BROADCAST	540-1720KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and set the pointer even with the gold dot at the low frequency end of the dial. Use isolation transformer if available, if not connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to stator on rear section of tuning gang. Low side to B-.	455KC	Tuning gang fully open	Across voice coil	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	50MMFD	High side to antenna terminal on antenna coil. (Remove hank antenna,) Low side to B-.	1720KC	"	"	A3	Adjust for maximum output.
3.	50MMFD	"	1400KC	Tune for max. output	"	A4	"

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: KNIGHT PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	12SA7	12SA7	8R	
V2	DET.-AVC-AF	12SQ7	12SQ7	8Q	
V3	Power Output	50L6GT	50L6GT	7AC	
V4	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: KNIGHT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	150	EC-12	PRS150/40-20	EDL-4215		TA-240	Filter-Red
B	20	150						Filter-Yellow
C2	51		MC-4	1468-00005	5W5Q5	GP1K-50	1FM-45	Osc. Grid Cap.
C3	.25	200	PC-4	P488-25	GT2P25		TC-2	Bias Filter
C4	.05	200	PC-2	P288-05	PTE4S5		TM-15	AVC Filter
C5	110	500	MC-2	1468-0001	5W5T1	GP1K-100	1FM-31	Diode RF Filter
C6	500	500	MC-6	1468-0005	5W5T5	GP2K-500	1FM-35	Tone Compensation
C7	05	400	PC-5	P488-05	PTE4S5		TM-15	Phono Isolation
C8	.006	600	PC-10	P688-006	PTE6D6	811-005	TM-26	Audio Coupling
C9	500	500	MC-6	1468-0005	5W5T5	GP2K-500	1FM-35	AF Amp. Plate Bypass
C10	.006	600	PC-10	P688-006	PTE6D6	811-005	TM-26	Audio Coupling
C11	.01	400	PC-7	P488-01	PTE4S1	821-01	TM-11	Output Plate Bypass
C12	.1	400	PC-8	P488-1	PTE4P1		72P52	Line isolation
C13	.05	400	PC-5	P488-05	PTE4S5		TM-15	Line Filter
C14	15			GP15M	5W5Q2	GP1K-15	MS-415	RF Coupling Note

Note. Not used in all models.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: KNIGHT PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	VC-4	Q13-137		Volume control
B	Switch		Not Req.	76-1		Attach to R1A per instructions

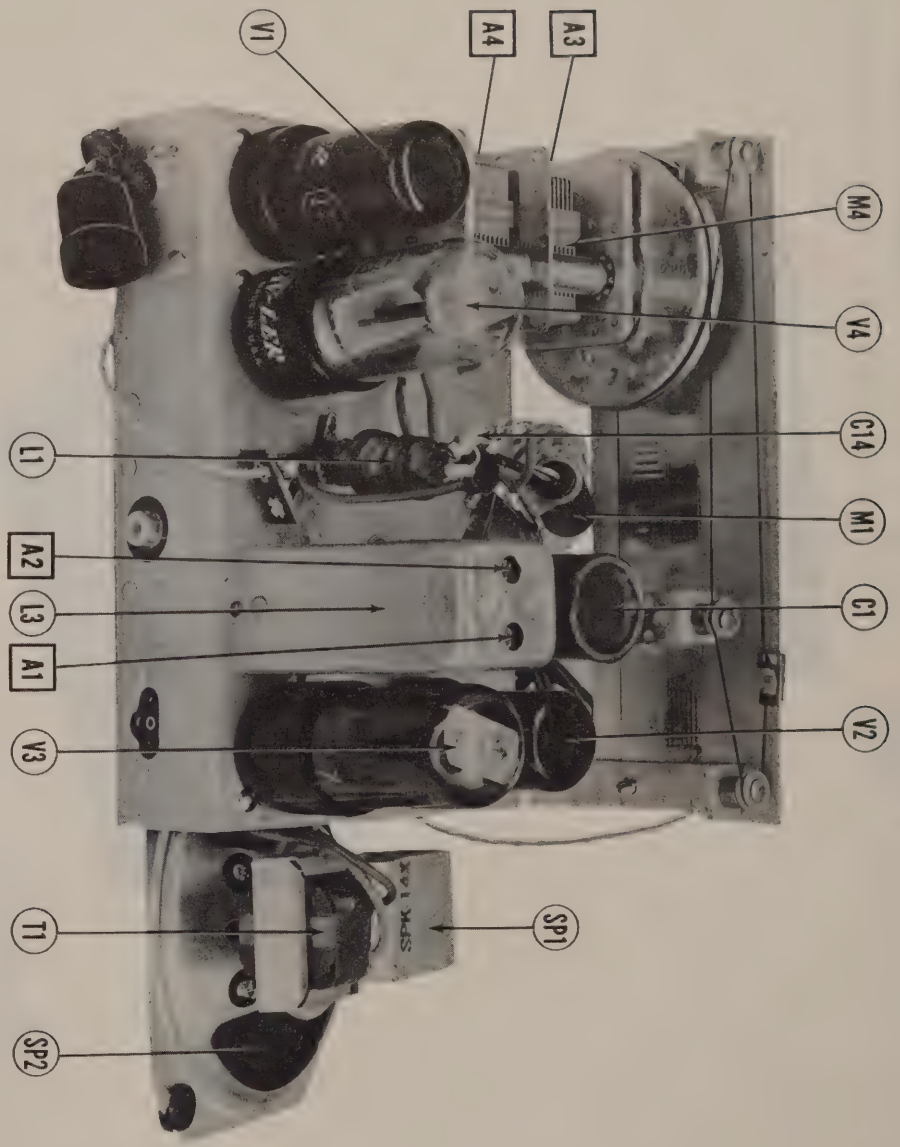
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: KNIGHT PART No.	IRC PART No.	IDENTIFICATION CODES
R2	22KΩ	½	IR-9	BTS-22K	Osc. Grid
R3	47KΩ	½	IR-10	BTS-47K	Bias Network
R4	3.3 Meg.	½	IR-23	BTS-3.3 Meg.	AVC Network
R5	10 Meg.	½	IR-3	BTS-10 Meg.	AF Grid
R6	470KΩ	½	IR-11	BTS-470K	AF Plate
R7	470KΩ	½	IR-11	BTS-470K	Output Grid
R8	220KΩ	½	IR-20	BTS-220K	Isolation
R9	470KΩ	½	IR-11	BTS-470K	Tone Compensation
R10	220KΩ	½	IR-20	BTS-220K	Phono Pick-up Load
R11	2200Ω	1	IR-25	BW-1-2200	Filter
R12	33Ω	½	IR-17		Surge Limiter
R13	47Ω	1	IR-41	BW-1-47	Filament Dropping

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: KNIGHT PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	1.8KΩ	3.4Ω	150Ω	.5Ω	Part of SPK-10	A-3332	A-3025		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: KNIGHT PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.		ST-113 *		
SP1	PM	3.4Ω	SPK-10	MOD. P4-X	4A07 *	* Remount output transformer.
	CONE DIA.	V. C. DIA.				
SP2	3 7/8"	9/16"				

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: KNIGHT PART No.	MEISSNER PART No.
L1	Ant. Coil	28Ω	2.5Ω		14-1071
L2	Osc. Coil	.8Ω	6.1Ω	LO-14	14-1073
L3	IF Trans.	16Ω	16Ω	LI-8	16-6660

DIAL LIGHTS

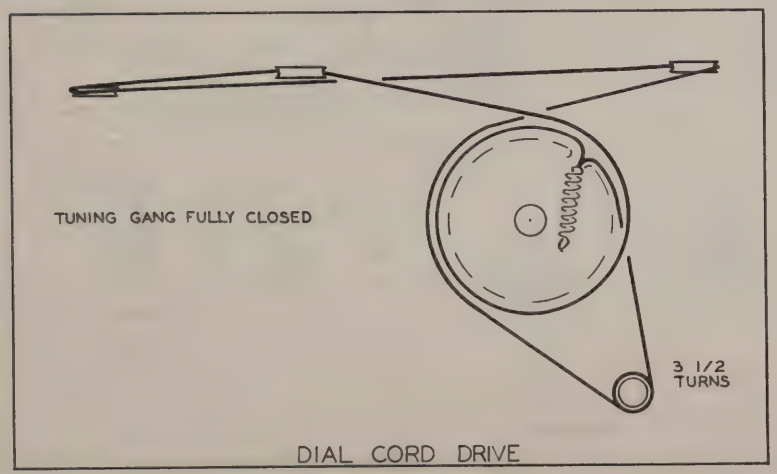
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA: KNIGHT PART No.		NOTES
M1	Bayonet	6-8	.15	Brown	PB-1		Type #47

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA: KNIGHT PART No.	ASTATIC PART No.	SHURE PART No.	REMARKS
M2		LQD1M		

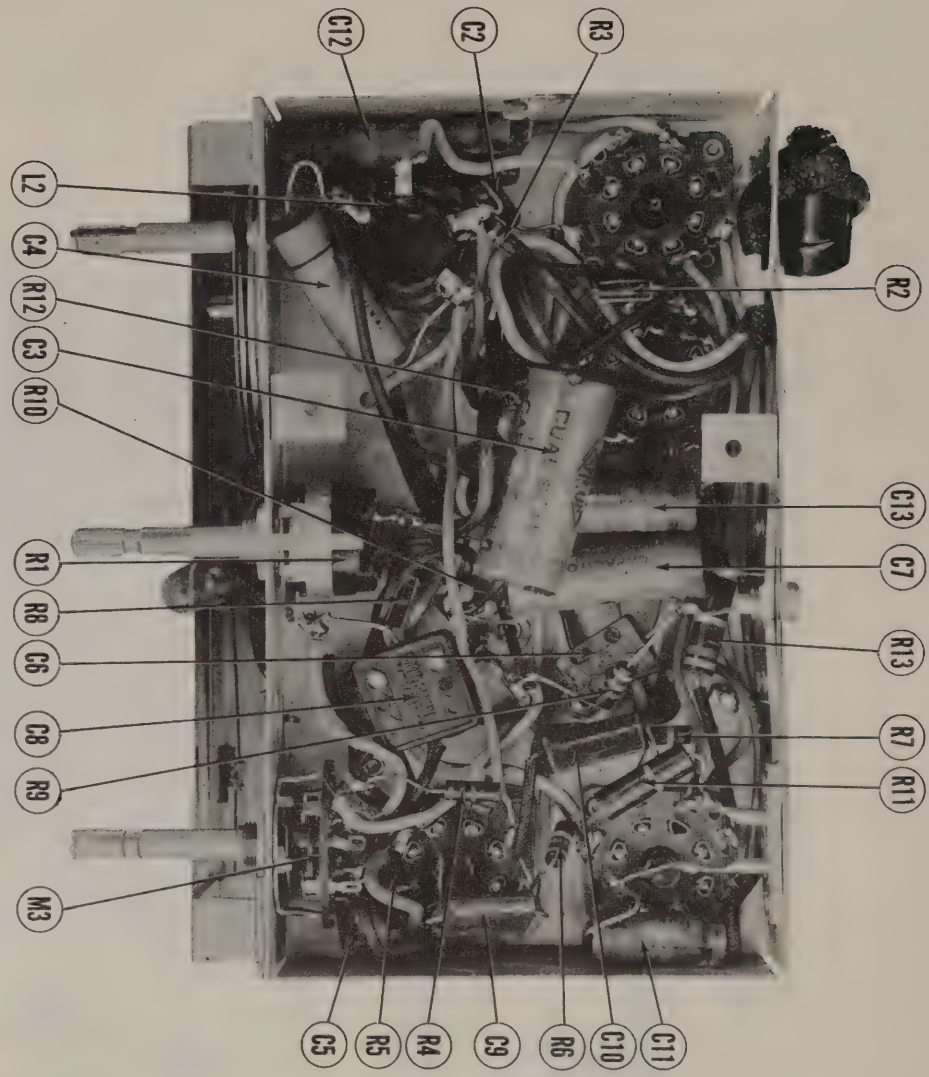
MISCELLANEOUS

ITEM No.	PART NAME	KNIGHT PART No.	NOTES
M3	Switch	SW-1	Radio-Phono
M4	2 Gang Var. Cap.	GC-6	(24-449MMF, 32-195MMF)

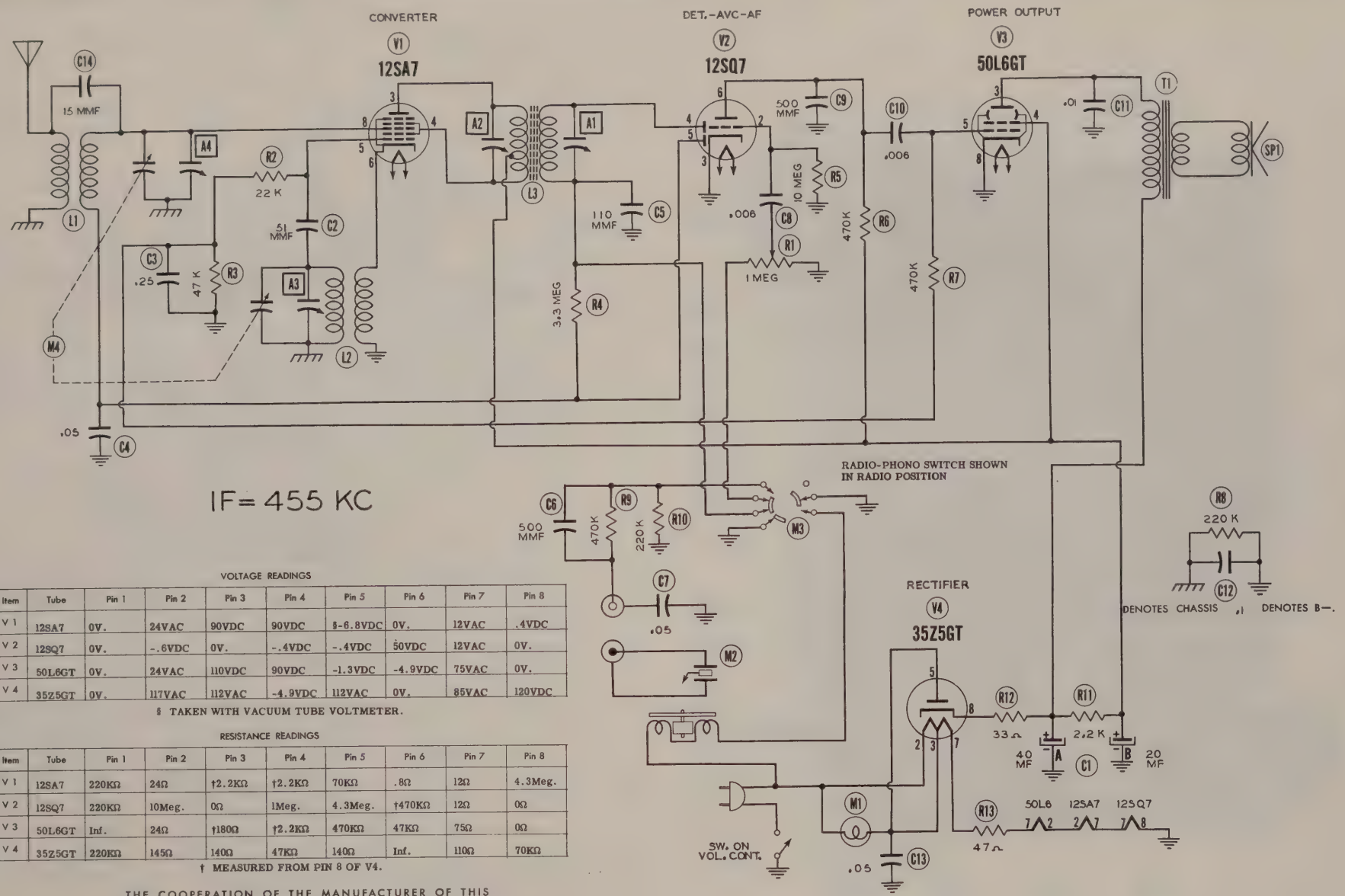


DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



KNIGHT MODEL 4G420



IF= 455 KC

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7	0V.	24VAC	90VDC	90VDC	5-6.8VDC	0V.	12VAC	.4VDC
V 2	12SQ7	0V.	-.6VDC	0V.	-.4VDC	-.4VDC	50VDC	12VAC	0V.
V 3	50L6GT	0V.	24VAC	110VDC	90VDC	-1.3VDC	-4.9VDC	75VAC	0V.
V 4	35Z5GT	0V.	117VAC	112VAC	-4.9VDC	112VAC	0V.	85VAC	120VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7	220KΩ	24Ω	†2.2KΩ	†2.2KΩ	70KΩ	.8Ω	12Ω	4.3Meg.
V 2	12SQ7	220KΩ	10Meg.	0Ω	1Meg.	4.3Meg.	†470KΩ	12Ω	0Ω
V 3	50L6GT	Inf.	24Ω	†180Ω	†2.2KΩ	470KΩ	47KΩ	75Ω	0Ω
V 4	35Z5GT	220KΩ	145Ω	140Ω	47KΩ	140Ω	Inf.	110Ω	70KΩ

† MEASURED FROM PIN 8 OF V4.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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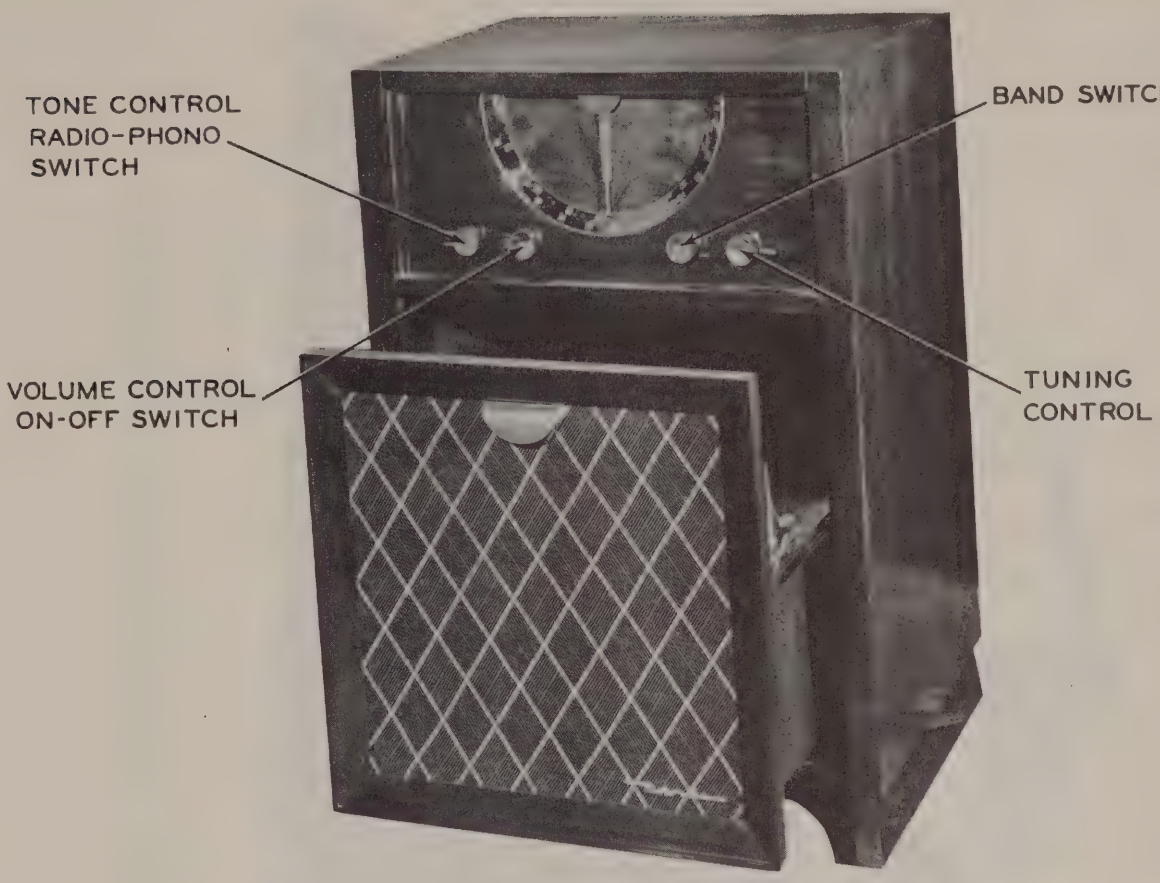
88-6

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

MOTOROLA MODELS 79FM21, 79FM21B, 79FM21R (Ch. HS-178)



MOTOROLA MODELS 79FM21, 79FM21B, 79FM21R (Ch. HS-178)

MOTOROLA MODEL 79FM21R

TRADE NAME	Motorola, Models 79FM21, 79FM21B, 79FM21R (Ch. HS-178)	
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago, Illinois	
TYPE SET	AC Operated Combination Phono-Radio, AM-FM Superheterodyne Reeeiver with Loop Antenna	
TUBES(SIX)	Types 12BA6 RF Amp., 12BA7 Converter, 12BA6 lst IF Amp., 12BA6 FM lst IF Amp., 19T8 DET-AVC-AF, 50C5 Power Output	
POWER SUPPLY	110-120 Volts AC	RATING .43 Amp. at 117 Volts AC
TUNING RANGE-BROADCAST	535-1620KC	FREQ. MOD. 83-108MC

DISSASEMBLY INSTRUCTIONS

1. Remove four push-on type control knobs.
2. Remove five screws holding rear cover.
3. Pull out cover, remove antenna plug from rear of chassis. Disconnect green lead from loop. Remove rear cover.
4. Disconnect phono motor power plug.
5. Disconnect phono pick-up plug.
6. Remove two 1/4" hex head bolts and nuts holding power interlock plug.
7. Disconnect speaker lead plugs.
8. Remove three 1/4" hex head bolts holding chassis.
9. Loosen set screw holding dial indicator shaft.
10. Remove chassis.
11. Remove four 5/16" hex nuts holding speaker. Remove speaker.

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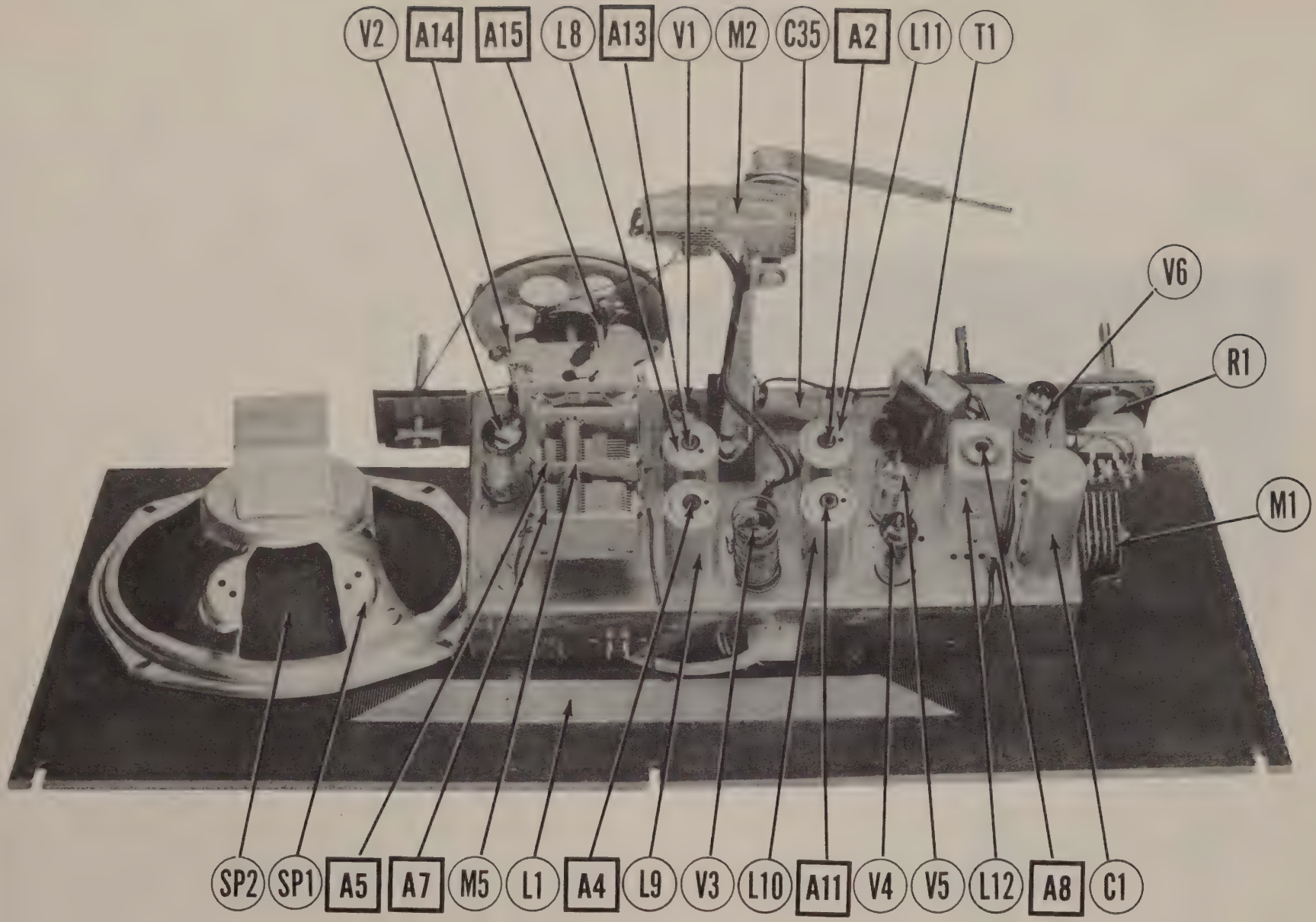
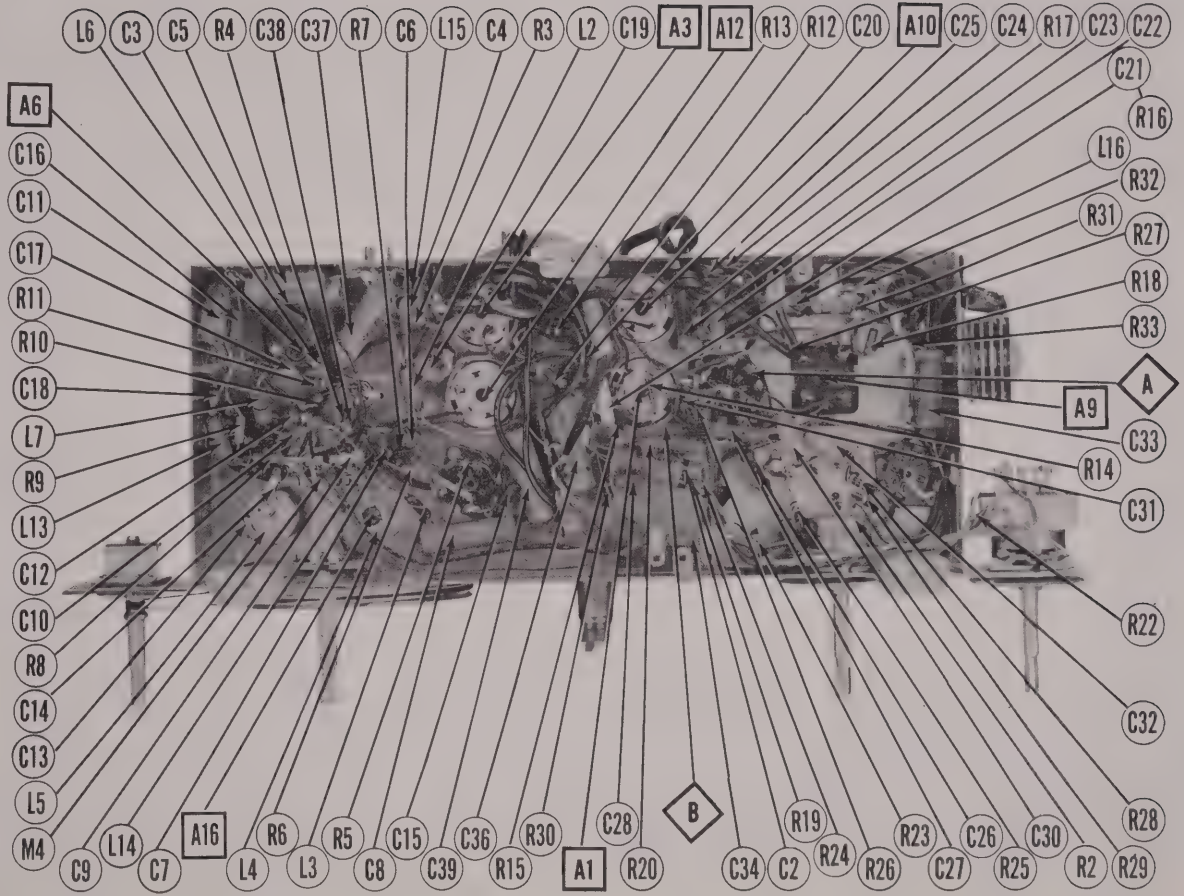

V2
A14
A15
L8
A13
V1
M2
C35
A2
L11
T1
V6
R1
M1
SP2
SP1
A5
A7
M5
L1
A4
L9
V3
L10
A11
V4
V5
L12
A8
C1


L6
C3
C5
R4
C38
C37
R7
C6
L15
C4
R3
L2
C19
A3
A12
R13
R12
C20
A10
C25
C24
R17
C23
C22
C21
R16
L16
R32
R31
R27
R18
R33
A
A9
C33
R14
C31
R22
C32
R28
R29
R25
R2
C30
C26
R23
R26
C27
R24
R19
C2
C34
B
C28
R20
A1
R30
C36
C15
R5
R6
L4
L3
C8
C39
R15
A16
L14
C7
C9
M4
L5
C13
C14
R8
C10
C12
L13
R9
L7
C18
R10
R11
C17
C11
C16
A6

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and set pointer parallel with the top of the chassis.
Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and chassis.

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (Grid) of 12BA7 (V2). Low side to chassis.	455KC (400~ Mod.)	AM (CW)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	.1MFD	"	1620KC	"	"	"	A5	"
3.	.1MFD	"	538KC	"	Tuning gang fully closed	"	A6	"
4.		Loop	1400KC	"	Tune for max. output.	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (± 1%) resistors in series from point A to B-. The junction of these two resistors is alignment point C as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	.001MFD	High side to pin 7 (Grid) of 12BA7 (V2). Low side to chassis.	10.7MC (Unmod.)	FM (CCW)	Tuning gang fully open	DC Probe to Point (A) Common to chassis.	A8, A9, A10, A11 A12, A13	Detune A8 several turns counter clockwise. Adjust A9 thru A13 for maximum deflection.
6.	.001MFD	"	"	"	"	DC Probe to Point (B) Common to Point (C)	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Continue with step 8.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ~ modulation and 450KC sweep. Use 120 ~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	.001MFD	High side to pin 1 (Grid) of 12BA6 (V3). Low side to chassis.	10.7MC (450KC Sweep)	FM (CCW)	Point of non-interference	Vert. Amp. to Point (A) Low side to chassis.	A8, A9, A10, A11	Disconnect stabilizer capacitor C2. Detune A8 several turns counter-.clockwise. Adjust A9, A10 and A11 for maximum amplitude and symmetry as per Fig 1.
6.	.001MFD	High side to pin 7 (Grid) of 12BA7 (V2). Low side to chassis.	"	"	"	"	A12, A13	Adjust for maximum amplitude and symmetry as per Fig 1.
7.	.001MFD	"	"	"	"	Vert. Amp. to Point (B) Low side to chassis.	A8, A9	Reconnect capacitor C2. Adjust A8 so 10.7MC occurs at center of crossover lines as per Fig 2. Slightly retouch A9 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

Note that the band switch is turned to **AM** and the tuning gang adjusted for maximum output at 1320KC, for step 8, This is for **FM** calibration purposes, leave the gang in this position for step 9.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.		Loop	1320KC (400 ~ Mod.)	AM	1320KC (See note above)	Use output meter across voice coil.	Tuning gang	Radiate signal into receiver loop and adjust tuning gang for maximum output. Leave gang in this position for step 9.
9.	300Ω carbon res.	High side thru 300Ω to pin 2 (Grid) of 12BA7 (V2). Low side to chassis.	105MC (Unmod.)	FM	105MC (setting obtained in step 8)	DC Probe to Point (A) Common to chassis.	A14	Adjust for maximum deflection.
10.	Turn tuning fully closed. Turn adjustment nut A15 counter clockwise until the bottom end of the tuning slug is at bottom of the pipe, then turn A15 four turns to clockwise.							
11.	300Ω carbon res.	High side thru 300Ω to FM ant. terminal No. 2. Low side to terminal No. 1 (open jumper between terminals 2 and 3)	90MC	FM	Tune for max. deflection	DC Probe to Point (A) Common to chassis.	A16	Adjust for maximum deflection.
12.	"	"	105MC	"	"	"	A15	Adjust for maximum deflection. Repeat steps 11 and 12 until no further increase in deflection can be obtained. Make A16 the last adjustment.

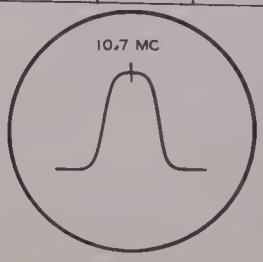


FIG. 1

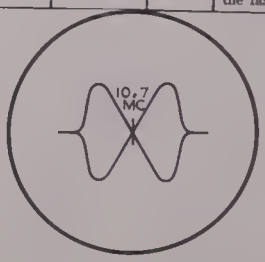
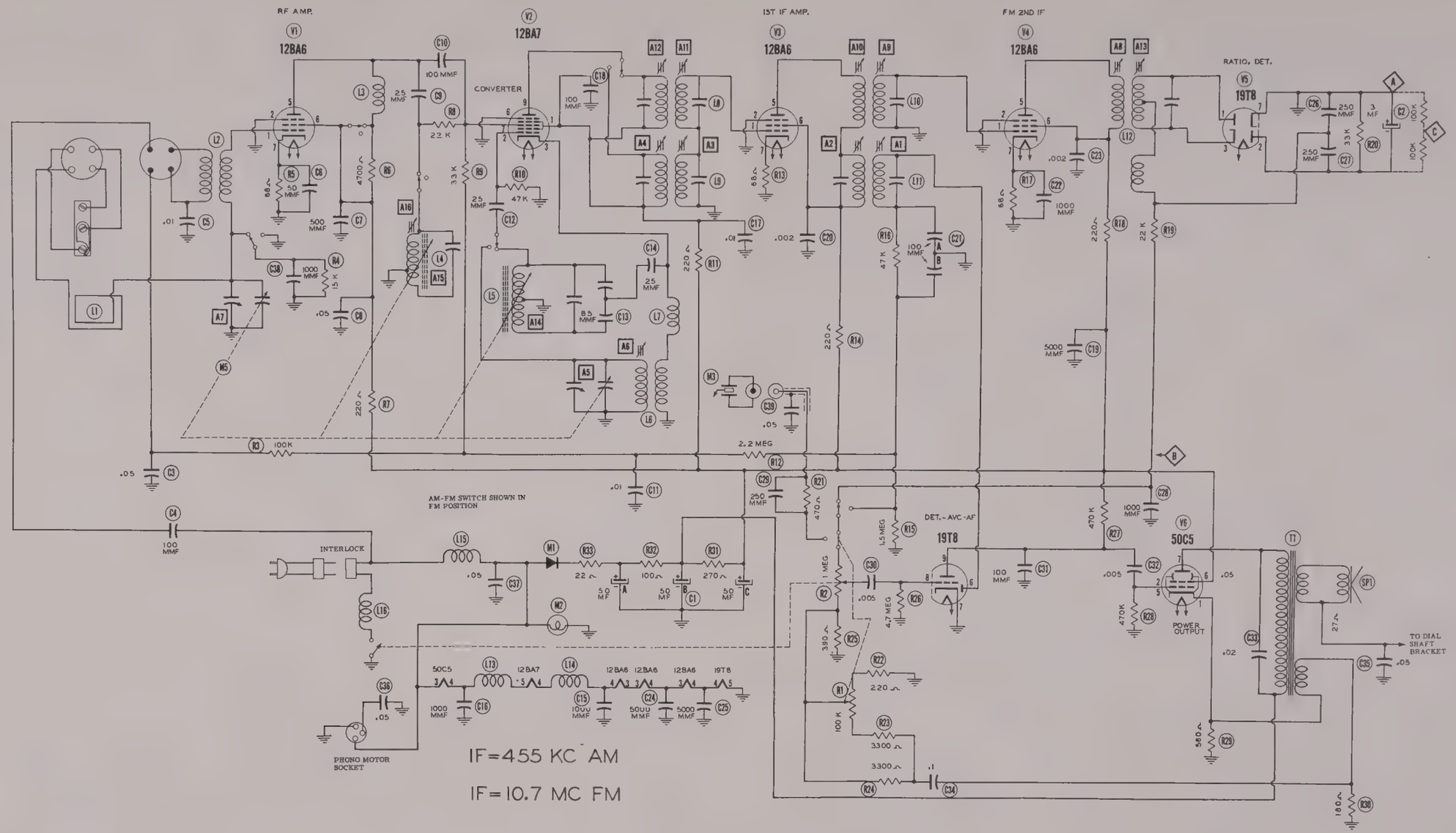


FIG. 2



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BA6	0V.	0V.	45VAC	58VAC	55VDC	97VDC	.9VDC		
V2A	12BA7	97VDC	§-7.6VDC	.1VDC	72VAC	60VAC	0V.	-.4VDC	0V.	97VDC
† V2B	12BA7	90VDC	§-2.6VDC	.1VDC	72 VAC	60VAC	0V.	-.1VDC	0V.	85VDC
V3	12BA6	0V.	0V.	45VAC	32VAC	90VDC	90VDC	1VDC		
† V4	12BA6	0V.	0V.	32VAC	19VAC	90VDC	99VDC	.8VDC		
V5A	19T8	-.5VDC	-1VDC	-.5VDC	19VAC	0V.	-.8VDC	0V.	-.9VDC	37VDC
† V5B	19T8	-.5VDC	-1VDC	-.5VDC	18VAC	0V.	-.8VDC	0V.	-.9VDC	37VDC
V6	50C5	6.5VDC	0V.	117VAC	72VAV	0V.	100VDC	110VDC		

§ TAKEN WITH VACUUM TUBE VOLTMETER.
† TAKEN IN FM POSITION.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BA6	1.1Ω	0Ω	35Ω	42Ω	†5.3KΩ	†600Ω	68Ω		
V2A	12BA7	†800Ω	47KΩ	3Ω	44Ω	50Ω	0Ω	2.5Meg.	0Ω	†600Ω
† V2B	12BA7	†800Ω	47KΩ	3Ω	44Ω	50Ω	0Ω	22KΩ	0Ω	†800Ω
V3	12BA6	15Ω	0Ω	35Ω	26Ω	†600Ω	†600Ω	68Ω		
† V4	12BA6	.9Ω	0Ω	26Ω	18Ω	†600Ω	†600Ω	68Ω		
V5A	19T8	Inf.	33KΩ	Inf.	16Ω	0Ω	650KΩ	0Ω	4.7Meg.	†470KΩ
† V5B	19T8	1 Meg.	33KΩ	1 Meg.	16Ω	0Ω	850KΩ	0Ω	4.7 Meg.	†470KΩ
V6	50C5	150Ω	470KΩ	70Ω	52Ω	470KΩ	†400Ω	†300Ω		

† MEASURED FROM OUTPUT OF M1.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	RF Amp.	12BA6	12BA6	7BK	
V2	Converter	12BA7	12BA7	8CT	
V3	1st IF Amp.	12BA6	12BA6	7BK	
V4	FM 2nd IF Amp.	12BA6	12BA6	7BK	
V5	DET.-AVC-AF	19T8	19T8	9E	
V6	Power Output	50C5	50C5	7CV	

CAPACITORS

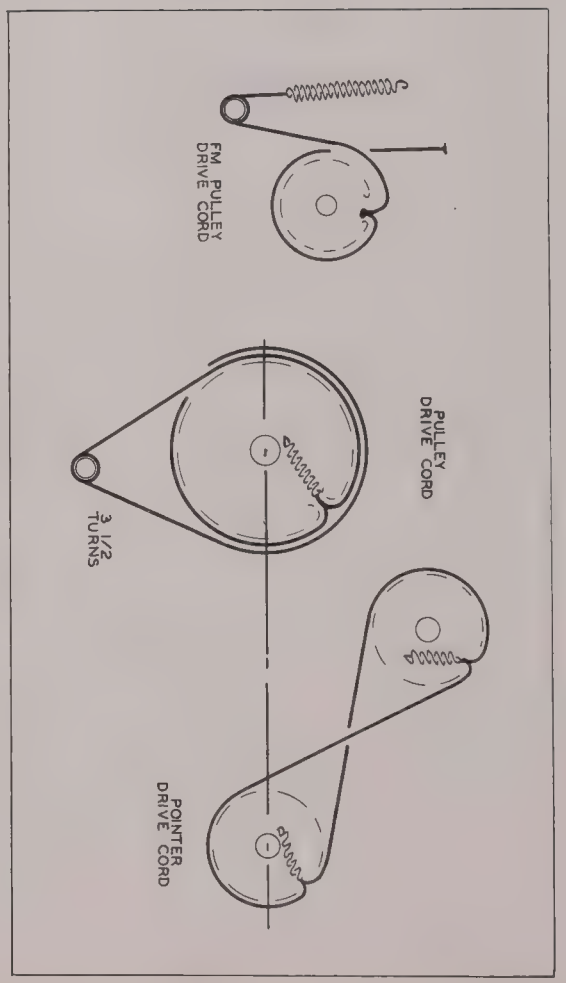
Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	50	150	23B690539	AF888D	UP44415		EL-340	■ Filter
B	50	150						▲ Filter
C	50	150						Filter
C2	3	50	23K690543	PRS150/4	BR550		TVA-12	Stabilizing Cap.
C3	.05	400	8A470606	P488-05	PTE4S5		TM-15	AVC Filter
C4	100		21B77286	GP100M	5W5T1	GP1K-100	1FM-31	FM Ant. Coupling
C5	.01	400	8S9809	P488-01	PTE4S1	GP2-335-01	TM-11	FM Ant. Isolation
C6	50		21K77373	GP50M	5W5Q5	GP1K-50	1FM-45	RF Cathode Bypass
C7	500		21K481377	GP500M	5W5T5	GP2K-500	1FM-35	RF Decoupling
C8	.05	200	8S9821	P288-05	PTE4S5		TM-15	RF Decoupling
C9	25		21K28816	GP25M	5W5Q25	GP1K-25	MS-425	RF Coupling
C10	100		21B77286	GP100M	5W5T1	GP1K-100	1FM-31	RF Coupling
C11	.01	100	8S9801	P488-01	PTE4S1	GP2-335-01	TM-11	AVC Filter
C12	25		21K28816	1468-000025	5W5Q25	GP1K-25	MS-425	Osc. Grid Cap.
C13	85		21A690688					Fixed Trimmer
C14	25		21K28816	1468-000025	5W5Q25	GP1K-25	MS-425	Osc. Feedback
C15	1000		21K478410	GP1000M	1W5D1	GP2L-001	1FM-21	RF Filament Bypass
C16	1000		21K478410	GP1000M	1W5D1	GP2L-001	1FM-21	Filament Bypass
C17	.01	400	8S9809	P488-01	PTE4S1	GP2-335-01	TM-11	Conv. Decoupling
C18	100		21B77286	GP100M	5W5T1	GP1K-100	1FM-31	Conv. Decoupling
C19	5000		21A470789	BPD-5	1D5D5	811-005	29C1	RF Bypass
C20	.002	400	8S9824	P688-002	PTE6D2	GP2M-002	TM-22	1st IF Decoupling
C21A	100		‡	GP100M	5W5T1	GP1K-100	1FM-31	Diode RF Filter
B	100			GP100M	5W5T1	GP1K-100	1FM-31	Diode RF Filter
C22	1000		21K478410	GP1000M	1W5B1	GP2L-001	1FM-21	2nd IF Cathode Bypass
C23	.002	400	8S9824	P688-002	PTE6D2	GP2M-002	TM-22	2nd IF Decoupling
C24	5000		21A470789	BPD-5	1D5D5	811-005	29C1	2nd IF Fil. Bypass
C25	5000		21A470789	BPD-5	1D5D5	811-005	29C1	2nd IF Fil. Bypass
C26	250		21K77375	GP250M	5W5T25	GP2K-250	1FM-325	Diode Load Cap.
C27	250		21K77375	GP250M	5W5T25	GP2K-250	1FM-325	Diode Load Cap.
C28	1000		21K478410	GP1000M	1W5D1	GP2L-001	1FM-21	De-emphasis
C29	250		§	GP250M	5W5T25	GP2K-250	1FM-325	Tone Compensation Note 1
C30	.005	100	8A24966	P688-005	PTE6D5	GP2M-005	TM-25	Audio Coupling
C31	100		21B77286	GP100M	5W5T1	GP1K-100	1FM-31	AF Plate Bypass
C32	.005	100	8A24966	P688-005	PTE6D5	GP2M-005	TM-25	Audio Coupling
C33	.02	400	8S9809	P488-02	PTE4S2		TM-12	Output Plate Bypass Note 2
C34	.1	200	8K471636	P288-1	PTE4P1		TM-1	Tone Compensation
C35	.05	400	8A470606	P488-05	PTE4S5		TM-15	Speaker Isolation
C36	.05	400	8A470606	P488-05	PTE4S5		TM-15	Record Changer Isolation
C37	.05	400	8A470606	P488-05	PTE4S5		TM-15	Line Filter
C38	1000		21K478410	GP1000M	1W5D1	GP2L-001	1FM-21	AVC Filter See Note 1
C39	.05	400	8A470606	P488-05	PTE4S5		TM-15	Phono Isolation

Note 1. Not used in all models.
Note 2. Some models use .01MFD in this application.
‡ Items C21A, C21B and R16 are combined into one unit, obtainable under MFGR'S part No. 21A473040.
§ Items C29 and R21 are combined into one unit, obtainable under MFGR'S Part No. 21K481868.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	100KΩ	½	18B691152			Tone control
B	Switch		Not Req.			Phono-Radio switch
R2A	1 Meg.	½	18A690549	QI3-137	AM-63-Z	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	Attach to R2A per instructions
C	Switch		Not Req.	76-1	SW-A	Attach to R2A per instructions



SET 88
FOLDER 7

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	MOTOROLA PART No.	IRC PART No.	
R3	100KΩ	½	6R6075	BTS-100K	AVC Network
R4	15KΩ	½		BTS-15K	RF Grid See Note 3
R5	68Ω	½	6R2039		RF Cathode
R6	4700Ω	½	6R6039	BTS-4700	RF Plate
R7	220Ω	½	6R3933	BW-½-220	RF Decoupling
R8	22KΩ	½	6R6028	BTS-22K	Conv. Grid
R9	33KΩ	½	6R6012	BTS-33K	Conv. Grid
R10	47KΩ	½	6R6056	BTS-47K	Osc. Grid
R11	220Ω	½	6R3933	BW-½-220	Conv. Decoupling
R12	2.2 Meg.	½	6R3927	BTS-2.2 Meg.	AVC Network
R13	68Ω	½	6R2039		1st IF Cathode
R14	220Ω	½	6R3933	BW-½-220	1st IF Decoupling
R15	1.5 Meg.	½	6R3966	BTS-1.5 Meg.	Diode Load
R16	47KΩ	½		BTS-47K	Diode Filter See Note 1
R17	68Ω	½	6R2039		2nd FM IF Cathode
R18	220Ω	½	6R3933	BW-½-220	2nd FM IF Decoupling
R19	22KΩ	½	6R6028	BTS-22K	De-emphasis
R20	33KΩ	½	6R6012	BTS-33K	Ratio Det. Diode Load
R21	470Ω	½		BTS-470	Tone Compensation See Note 2 and 3
R22	220Ω	½	6R3933	BW-½-220	Tone Compensation
R23	3300Ω	½	6R6036	BTS-3300	Tone Compensation
R24	3300Ω	½	6R6036	BTS-3300	Tone Compensation
R25	390Ω	½	6R5554	BW-½-390	Tone Compensation
R26	4.7 Meg.	½	6R2122	BTS-4.7 Meg.	AF Grid
R27	470KΩ	½	6R6032	BTS-470K	AF Plate
R28	470KΩ	½	6R6032	BTS-470K	Output Grid
R29	560Ω	½		BTS-560	Output Cathode See Note 4
R30	180Ω	½		BW-½-180	Output Cathode See Note 5
R31	270Ω	2	6R476116	BW-2-270	Filter
R32	100Ω	2	6R3963	BW-2-100	Filter
R33	22Ω	1.5	17A690578		Surge Limiter-Wire Wound

Note 1. Items C21A, C21B and R16 are combined into one unit, obtainable under MFGR'S part No. 21A473040.
Note 2. Items C29 and R21 are combined into one unit, obtainable under MFGR'S part No. 21K481868.
Note 3. Not used in all models.
Note 4. Some models use 390Ω resistor in this application.
Note 5. Some models use 270Ω resistor in this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2400Ω	4Ω	185Ω	.4Ω SEC. 2 25Ω	25B690805		A-3031 *		* Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	FIELD	V. C. IMP.		ST-115		
	PM	4Ω	50C691118	MOD. P8-V	8A21	
	CONE DIA.	V. C. DIA.				
SP2	7 1/4"	3/4"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	
L1 L2	AM Loop Ant. FM Ant. Trans.	1.8Ω .1Ω	.1Ω	1X691149 24A690544		Includes line cord, power and ant. input plugs.

PARTS LIST AND DESCRIPTIONS (Continued)

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	
L3	RF Choke	0Ω		24A90064		
L4	FM RF Coil	0Ω		24C690584		Inductor and capacitor assy.
L5	FM Osc. Coil	0Ω		24C690580		Inductor and capacitor assy.
L6	AM Osc. Coil	.2Ω	7Ω	24B690563	14-1060	
L7	RF Choke	2.5Ω		24K780128		
L8	1st FM IF	2Ω	.9Ω	24B690540		Less shield
L9	1st AM IF	14Ω	14Ω	24B482863	16-6678	Less shield
L10	2nd FM IF	5Ω	.9Ω	24B690541		Less shield
L11	2nd AM IF	14Ω	14Ω	24B482865	16-6678	Less shield
L12	Ratio Det. Trans.	2Ω	0Ω	24B690542		Complete
L13	Fil. Choke	2.5Ω		24K780128		
L14	Fil. Choke	2.5Ω		24K780128		
L15	Line Choke	1.5Ω		24K691041		
L16	Line Choke	1.5Ω		24K691041		

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	MOTOROLA PART No.	SYLVANIA PART No.		
M1	.097A	48B482807	ND-5		

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					MOTOROLA PART No.		
M2	Bayonet	117			65K691040		Type 117V 10W

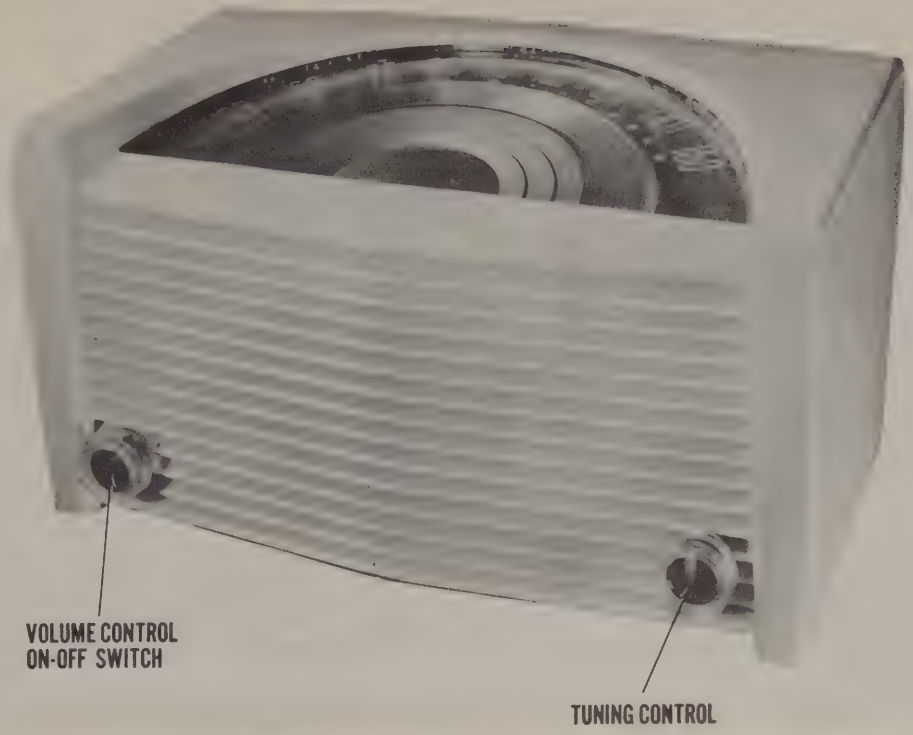
PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA			REMARKS
	Motorola PART No.	ASTATIC PART No.	SHURE PART No.	
M3		CQ-J or GC-J		

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M4	Switch	40B690538	Band
M5	2 Gang. Var. Cap.	19B690747	(25-468MMF, 38-214MMF)
	Knob	36K690886	Models 79FM21, 79FM21R
	Knob	36K691195	Model 79FM21B
	Dial Scale	36K690592	
	Pointer Assby.	1X691148	

PHILCO
MODELS 50-920, 50-921, 50-922



PHILCO
MODELS 50-920, 50-921, 50-922

PHILCO MODEL 50-921

TRADE NAME	Philco, Models 50-920, 50-921, 50-922
MANUFACTURER	Philco Corp., Tioga and "C" Sts., Philadelphia, Pa.
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES (SIX)	Types 7B7 RF Amp., 7A8 Converter, 7B7 IF Amp., 14B6 DET-AVC-AF, 50C5 or 50L6GT Power Output, 35Z5GT Rectifier
POWER SUPPLY	105-120 Volts AC-DC RATING .26 Amp. at 117 Volts AC
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set dial pointer turn tuning gang fully closed and set the center of the pointer carriage even with the last calibration mark on the left hand end of the pointer carriage slide.

Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and B-.

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to stator on front section of tuning gang. Low side to B-.	455KC (400 ~ Mod.)	Tuning gang fully closed	Connect to green and black wires on loop terminal strip.	A1, A2, A3, A4	Adjust for maximum output. If isolation is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1600KC	Set center of pointer carriage to the calibration mark on right hand end of slide.	"	A5	Pre-set A8 1/2 turn from tight. Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1500KC	Tune for max. output.	"	A6, A7	"
4.		Loop	580KC	Set center of pointer carriage to second calibration mark from left.	"	A8, A9	Pre-set A8 1/2 turn from tight. Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Repeat steps 2, 3 and 4 until no further improvement can be made.

HOWARD W. SAMS & CO., INC. • Indianapolis 1, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		PHILCO PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	7B7	7B7	8V	
V2	Converter	7A8	7A8	8U	
V3	IF Amp.	7B7	7B7	8V	
V4	DET.-AVC-AF	14B6	14B6	8W	
V5A	Power Output	50C5	50C5	7CV	
B	Power Output	50L6GT	50L6GT	7AC	
V6	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA					IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	150	30-2575-27	PRSA888D	EDL44215		TA-304	Filter-Orange
B	30	150						Filter-Blue
C	30	150						Filter-Red
C2	.01	400	61-0120	P488-01	PTE4S1	821-01	TM-11	Decoupling
C3	47		30-1227-5	GP47M	5W5Q5	GP1K-47	1FM-45	Osc. Grid Cap.
C4	13		20-1224-56	CI13JN750		N750K-13		Fixed Trimmer See Note
C5	.01	400	61-0120	P488-01	PTE4S1	821-01	TM-11	IF Screen Bypass
C6	.006	400	45-3500-7	P488-006	PTE6D6	GP2M-0056	TM-26	IF Decoupling
C7	.05	400	61-0122	P488-05	PTE4S5		TM-15	AVC Filter
C8	.01	400	61-0120	P488 01	PTE4S1	821-01	TM-11	Audio Coupling
C9	.01	600	61-0120	P688-01	PTE6S1	821-01	TM-11	Audio Coupling
C10	220		62-122001001	GP220M	5W5T25	GP2K-220	1FM-325	Output Grid Bypass
C11	.02	400	61-0108	P488-02	PTE4S2		TM-12	Output Plate Bypass
C12	.1	400	61-0113	P488-1	PTE4P1		72P52	Line Isolation
C13	.047	400	30-4668-45	P488-047	PTE4S5		TM-15	Line Filter

Note. Some models use 20MMF in this application.

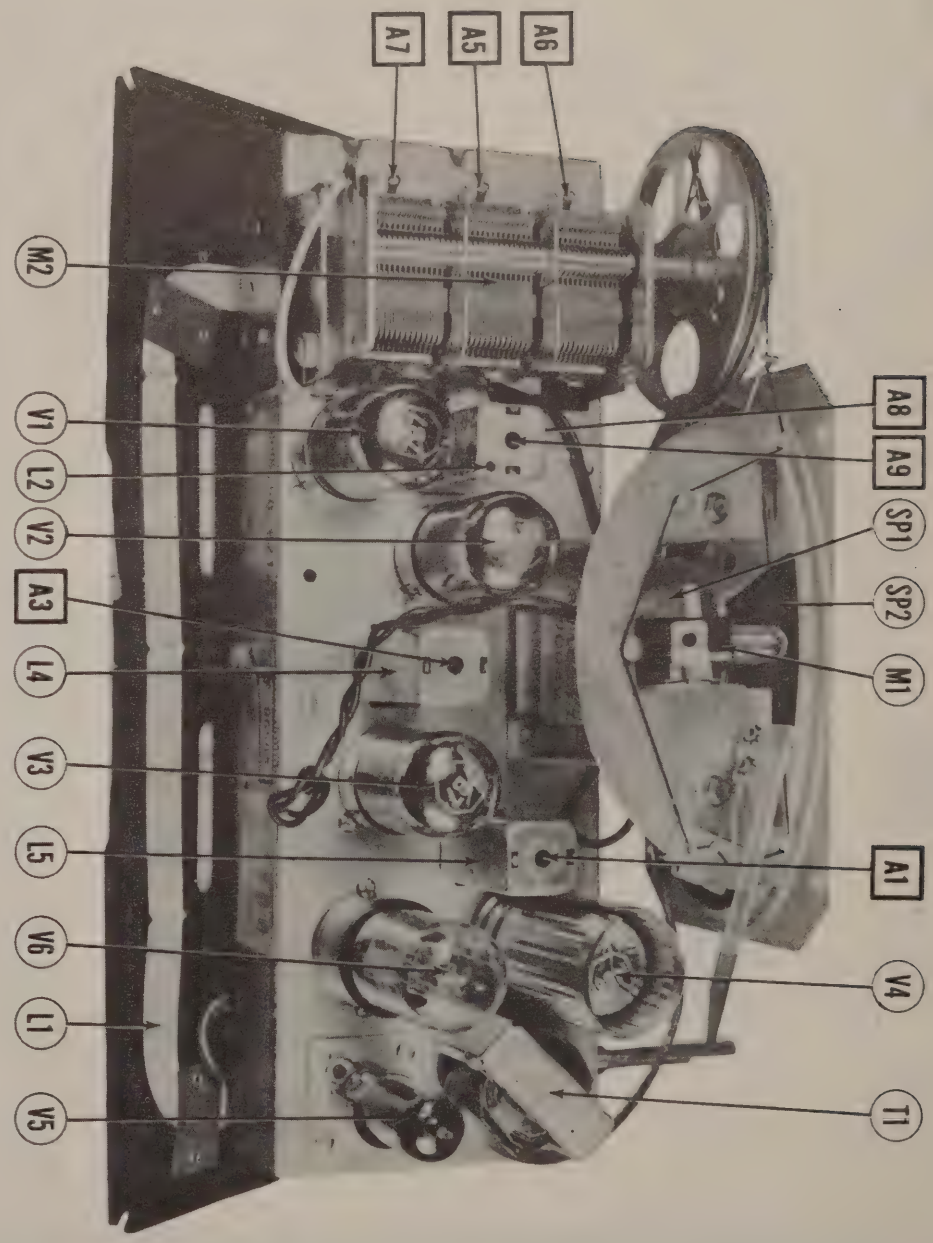
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	
R1A	500KΩ	½	33-5566-13	Q13-133		Volume control
B	Switch			76-1		Attach to R1A per instructions

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	PHILCO PART No.	IRC PART No.	
R2	2.2 Meg.	½	66-5228340	BTS-2.2 Meg.	AVC Network
R3	22KΩ	½	66-3228340	BTS-22K	Screen Dropping
R4	100KΩ	½	66-4108340	BTS-100K	Osc. Grid
R5	47KΩ	½	66-3478340	BTS-47K	IF Screen
R6	1200Ω	½	66-2128340	BTS-1200	IF Decoupling
R7	47KΩ	½	66-3478340	BTS-47K	Diode Filter
R8	2.2 Meg.	½	66-5228340	BTS-2.2 Meg.	AVC Network
R9	3.3 Meg.	½	66-5338340	BTS-3.3 Meg.	AF Grid
R10	470KΩ	½	66-4479340	BTS-470K	AF Plate
R11	470KΩ	½	66-4478340	BTS-470K	Output Grid
R12	130Ω	½	66-1128340	BW-½-120	Output Cathode-Wire Wound
R13	150KΩ	½	66-4158340	BTS-150K	Isolation
R14	1200Ω	½	66-2124340	BW-1-1200	Filter
R15	220Ω	1	66-1225340	BW-1-220	Filter

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2.6KΩ	4Ω	315Ω	1Ω	32-8310-3	A-3876	A-2928	RO-2	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			PHILCO PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V. C. IMP.				
SP1	PM	4Ω	36-1633		46A1	
	CONE DIA.	V. C. DIA.				
SP2	3 7/8" x 5 7/8"	9/16"				

R F COILS

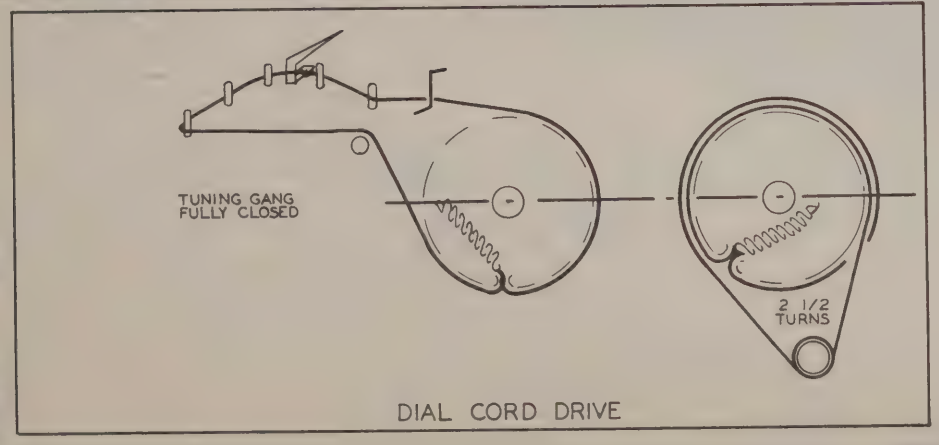
ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	PHILCO PART No.	MEISSNER PART No.	
L1A	Loop Ant.	.3Ω	3Ω	32-4052-40		Used in models 50-921, 50-922
B	Loop Ant.			30-4052-39		Used in models 50-920
L2	RF Trans.	100Ω	5Ω	32-4399-2A		
L3	Osc. Coil	2.5Ω	5.5Ω	32-4263-3	14-1073	
L4	Input IF	13Ω	13Ω	32-4160A	16-6668	
L5	Output IF	16Ω	16Ω	32-4240-3A		

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					PHILCO PART No.		
M1	Bayonet	6-8	.15	Brown	34-2676		Type #47

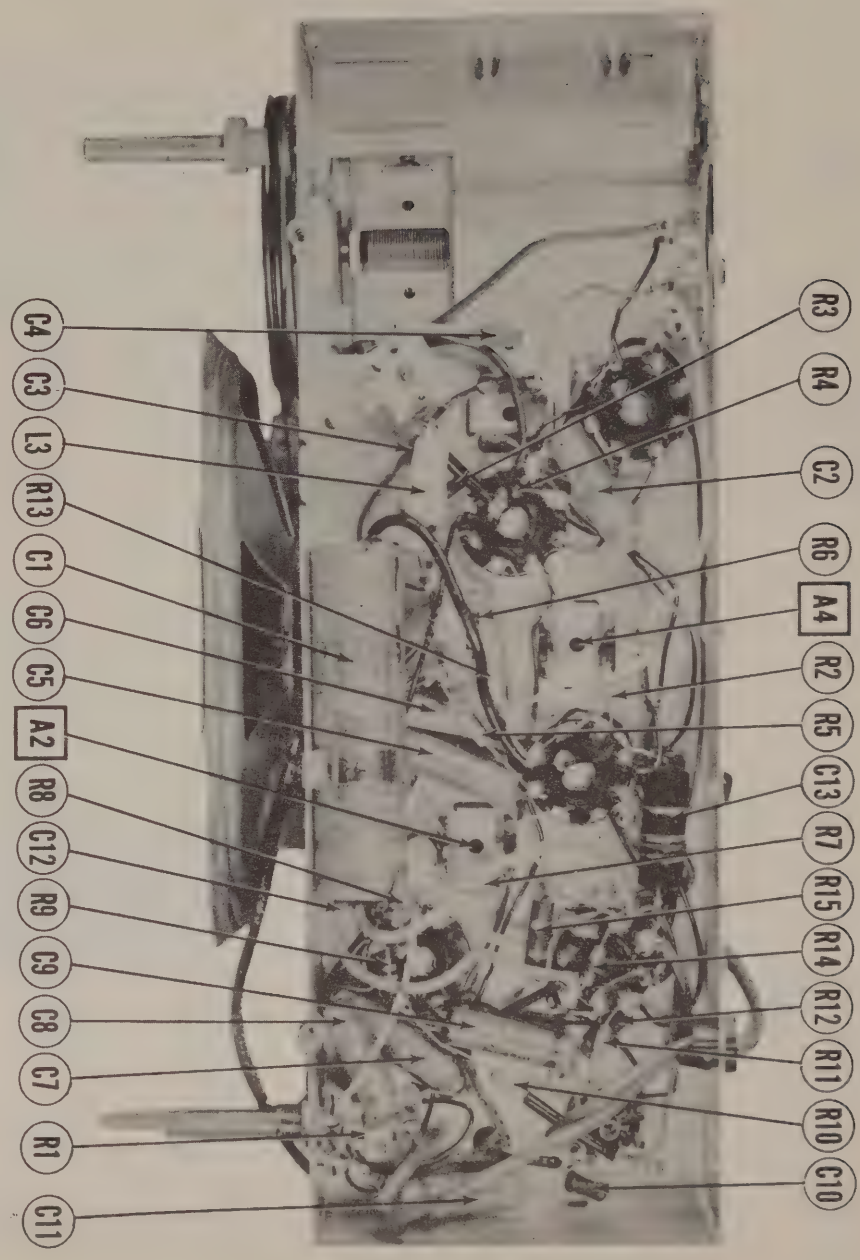
MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M2	3 Gang Var. Cap.	31-2748-1	(12-496MMF) Each Section
A8	Padder	31-6473-17	Osc. Adj.
	Dial Scale	54-5070	Model 50-920, Mahogany Cabinet
	Dial Scale	54-5070-2	Model 50-920, Gray Cabinet
	Dial Scale	54-5071	Model 50-921
	Dial Scale	54-5072	Model 50-922

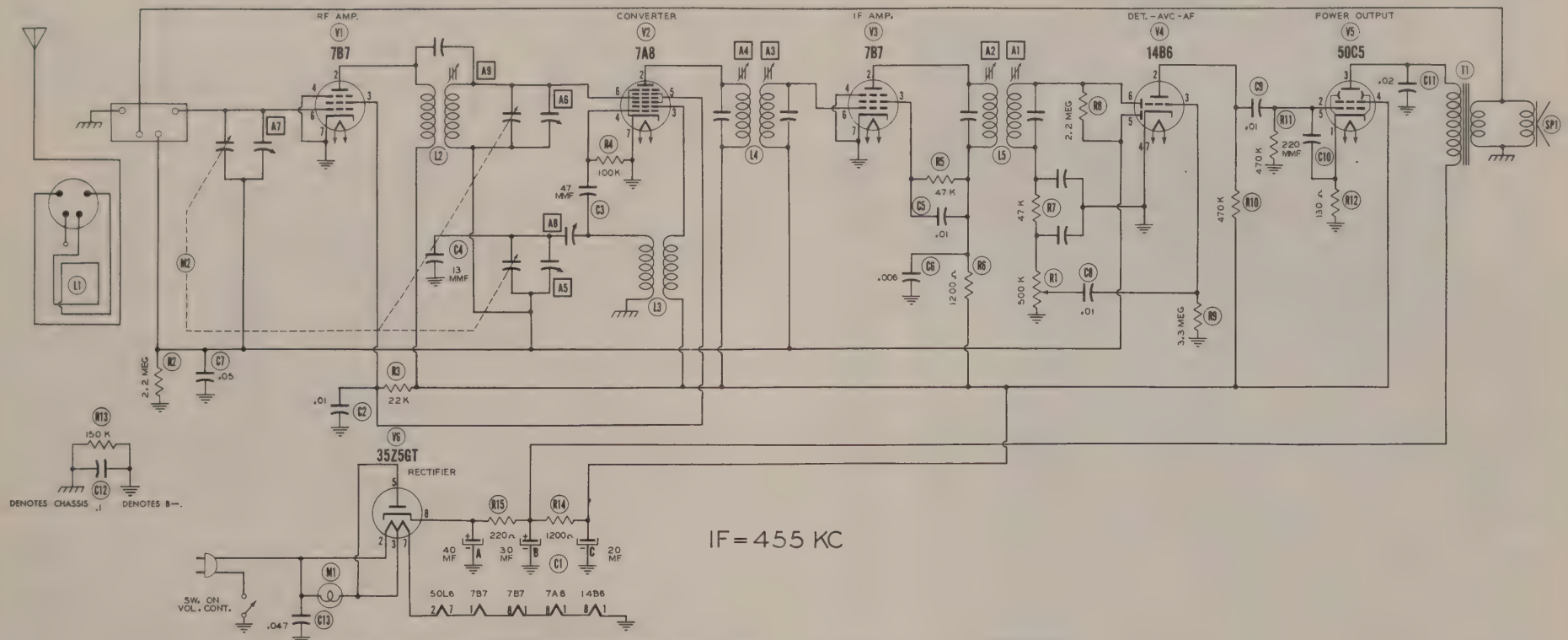


DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



PHILCO MODEL 50-921



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	7B7	21VAC	95VDC	45VDC	0V.	0V.	-.8VDC	0V.	28VAC
V 2	7A8	14VAC	95VDC	95VDC	8-8.4VDC	45VDC	-.6VDC	0V.	21VAC
V 3	7B7	35VAC	90VDC	50VDC	0V.	0V.	-.8VDC	0V.	28VAC
V 4	14B6	0V.	45VDC	-.8VDC	0V.	-.8VDC	-.8VDC	0V.	14VAC
V 5	50C5	6.3VDC	.1VDC	35VAC	85VAC	.1VDC	95VDC	97VDC	
V 6	35Z5GT	95VDC	117VAC	111VAC	0V.	111VAC	112VDC	85VAC	125VDC

‡ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	7B7	20Ω	†1.5KΩ	†23KΩ	0Ω	0Ω	1.5Meg.	0Ω	27Ω
V 2	7A8	13Ω	†1.5KΩ	†1.5KΩ	100KΩ	†22KΩ	1.5Meg.	0Ω	20Ω
V 3	7B7	34Ω	†2.5KΩ	†48KΩ	0Ω	0Ω	1.5Meg.	0Ω	27Ω
V 4	14B6	0Ω	†470KΩ	3.3 Meg.	0Ω	1.5Meg.	500KΩ	0Ω	13Ω
V 5	50C5	130Ω	470KΩ	34Ω	85Ω	470KΩ	†1.5KΩ	†520Ω	
V 6	35Z5GT	†1.2KΩ	110Ω	105Ω	0Ω	105Ω	†220Ω	85Ω	60KΩ

† MEASURED FROM PIN 8 OF V6.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

RCA VICTOR MODELS 8TK29, 8TR29

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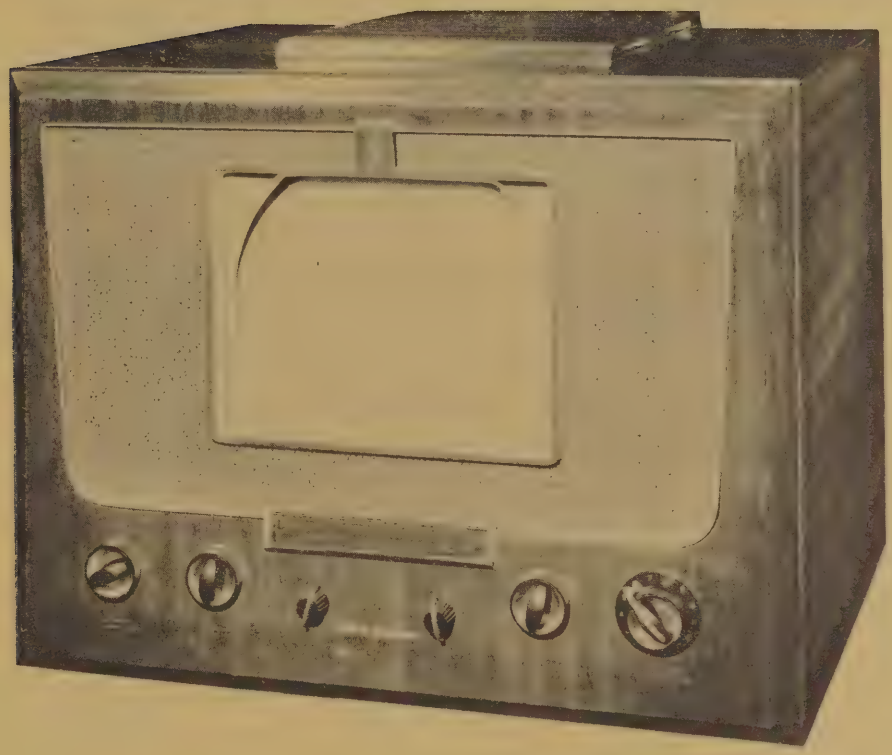

MODEL 8TR29

RCA VICTOR MODELS
8TK29, 8TR29

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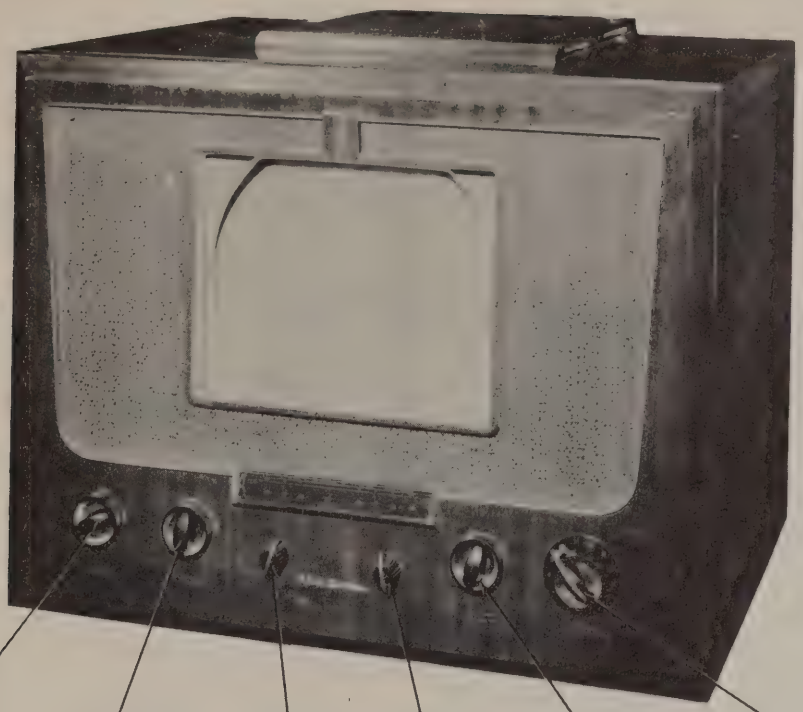
*TRADE MARK

RCA VICTOR MODELS 8TK29, 8TR29 (Ch.KCS32, A, B, C, & Radio Ch. RK135, A)



RCA VICTOR MODEL 8TR29

TRADE NAME	RCA Victor Models 8TK29, 8TR29 (Ch. KCS32, A, B, or C and Radio Tuner RK135 or RK135A)
MANUFACTURER	RCA Victor Div., Radio Corp. of America, Camden, New Jersey
TYPE SET	TV-AM-FM Receiver
TUBES	Twenty Nine
POWER SUPPLY	110-120 Volts AC-60 Cycle
TUNING RANGE	TV-Channels 2 thru 13 FM-88-108MC AM-540-1500KC

RATINGS (TV) 2.05 Amp. at 117 Volts AC
(Radio) .54 Amp. at 117 Volts AC

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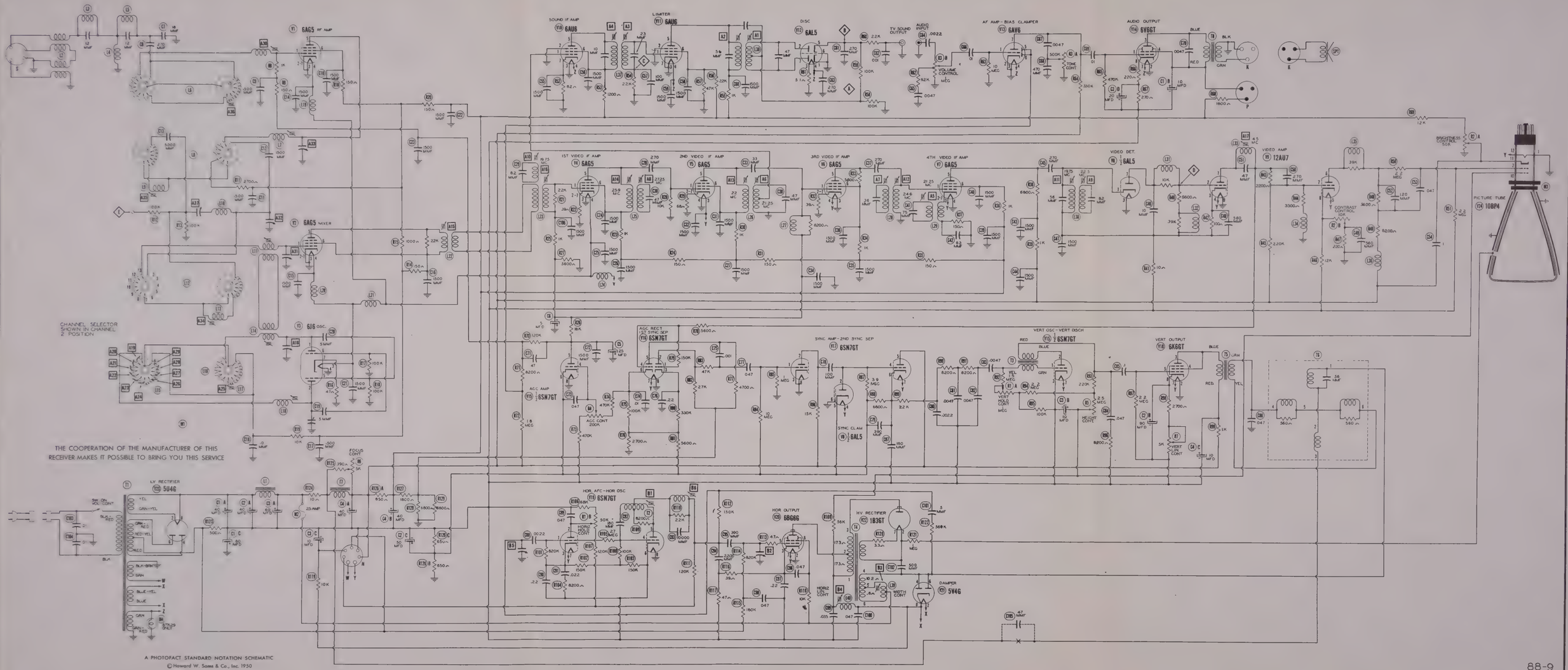
DATE 3-50 SET 88 FOLDER 9

RCA VICTOR MODELS 8TK29, 8TR29 (Ch.KCS32, A, B, C, & Radio Ch. RK135, A)



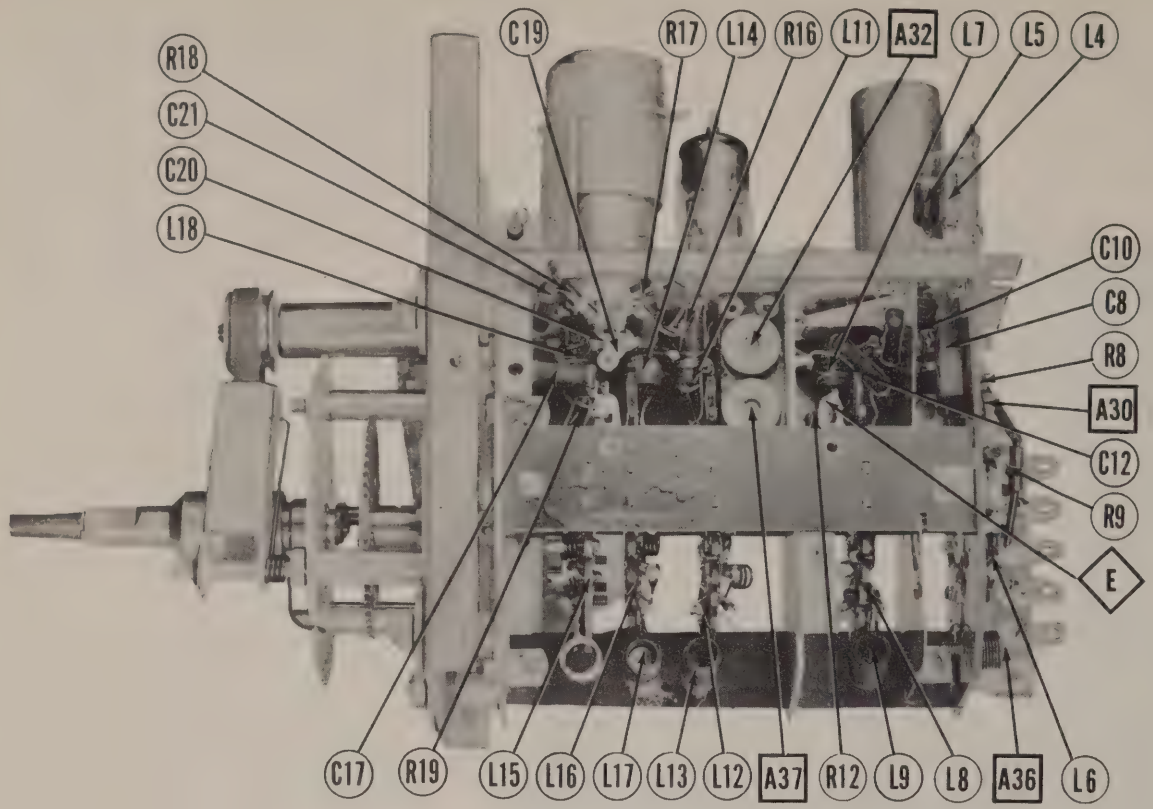
RCA VICTOR MODELS 8TK29, 8TR29
(Ch.KC532, A, B, C, & Radio Ch. RK135, A)

CHASSIS TOP VIEW

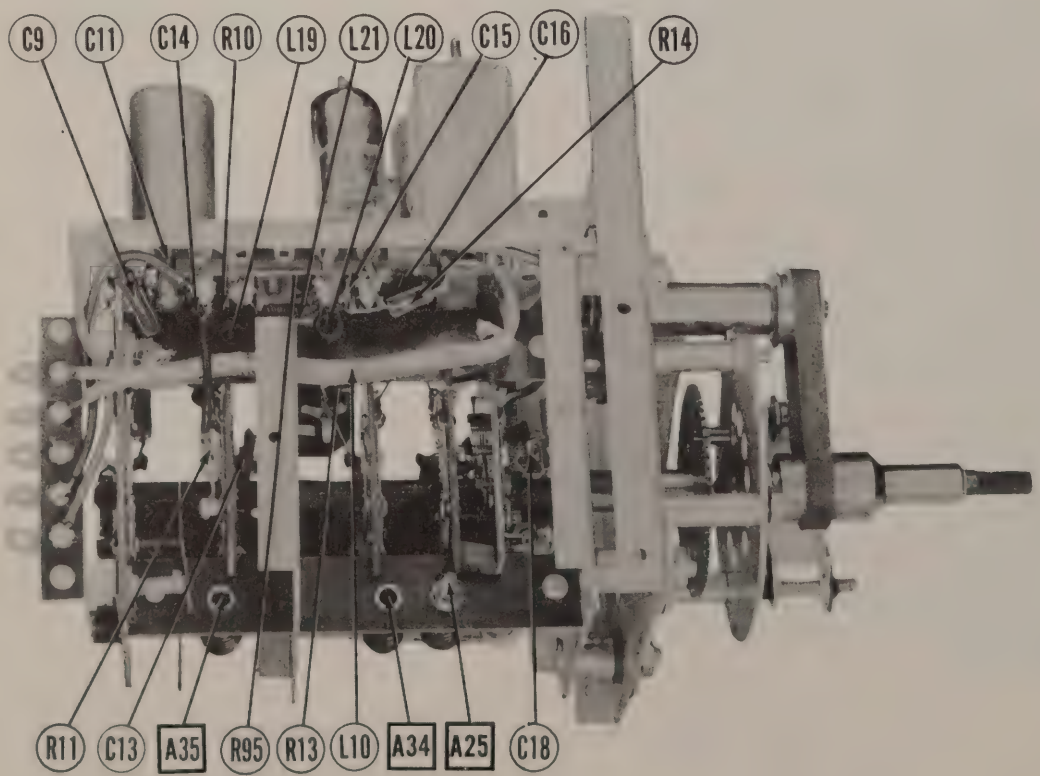
CHASSIS BOTTOM VIEW-TRANS.-INDUCTOR AND ALIGNMENT IDENTIFICATION

RCA VICTOR MODELS 8TK29, 8TR29
(Ch.KCS32,A,B,C,& Radio Ch.RK135,A)

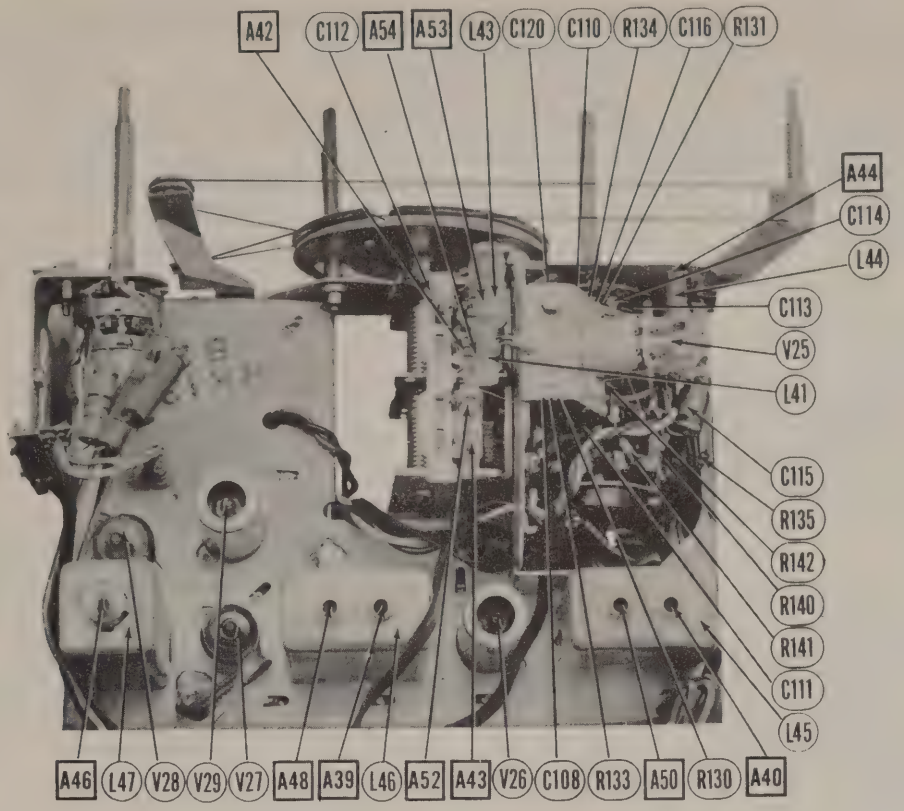
TUBE PLACEMENT CHART



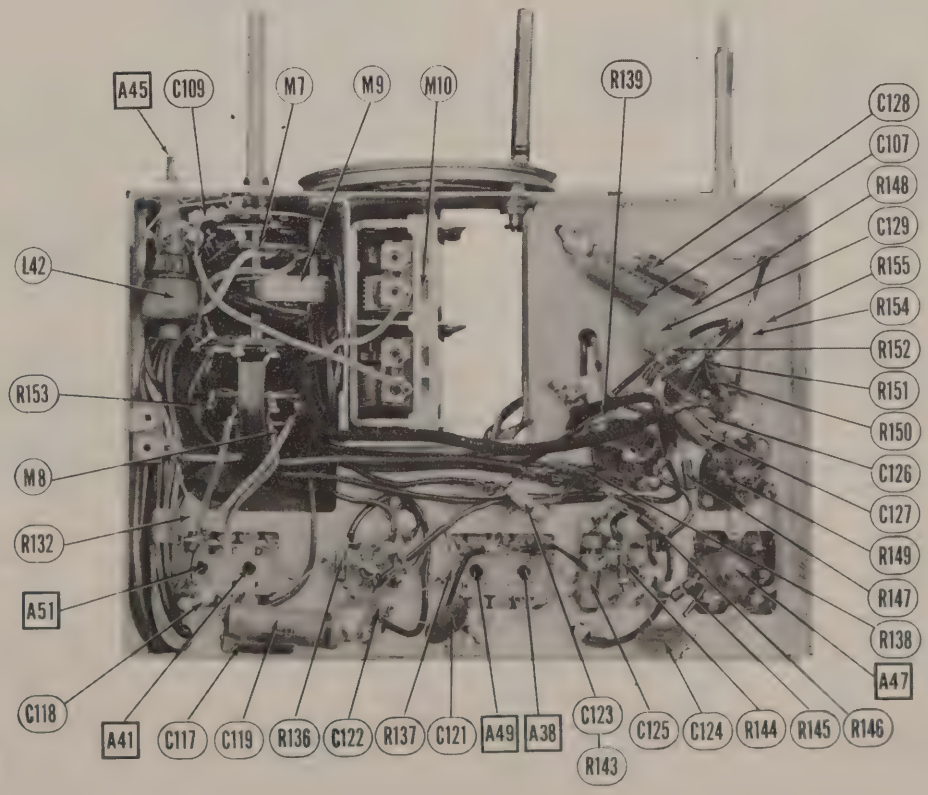
TV RF TUNER-RIGHT SIDE



TV RF TUNER-LEFT SIDE



AM-FM TUNER- TOP VIEW



AM-FM TUNER-BOTTOM VIEW

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Turn the function selector switch to "television", (maximum counter-clockwise).
The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube (V19).
When complete receiver alignment is to be performed, it can most conveniently be performed in the order given.
Set the channel switch to the blank position between channels 2 and 13.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to pin 1 (Grid) of 6AU6 (V11). Low side to chassis.	21.25MC (Unmod.)	See note under pre-alignment.	DC Probe thru 1 Meg. to Point (A) Low side to chassis.	A1, A2	Detune A1 several turns counter-clockwise. Adjust A2 for maximum deflection.
2.	.01MFD	"	"	"	DC Probe to Point (B) Common to chassis.	A1	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
3.	.01MFD	High side to pin 1 (Grid) of 6AU6 (V10). Low side to chassis.	"	"	DC Probe thru 1 Meg. to Point (C) Common to chassis.	A3, A4	Adjust for maximum deflection.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ~ modulation and 450KC sweep. Use 120 ~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.01MFD	High side to pin 1 (Grid) of 6AU6 (V10). Low side to chassis.	21.25MC (450KC Sweep)	21.25MC	See Note under pre-alignment	Vert. Amp. thru 33KΩ to Point (C) Low side to chassis.	A3, A4	Adjust for maximum amplitude and symmetry as per Fig 1.
2.	.01MFD	"	"	"	"	Vert. Amp. to Point (B) Low side to chassis.	A1, A2	Adjust A1 so 21.25MC occurs at center of crossover lines as per Fig 2. Adjust A2 for maximum amplitude and straightness of crossover lines. Continue with step 4.

VIDEO IF ALIGNMENT

Remove V15 from its socket.
Connect the negative lead of a 4.5 volt battery to pin 5 of the socket of V5, connect the positive lead to chassis.
Note that during video IF alignment the common lead of VTVM is at -120 volts with respect to chassis. Avoid grounding or touching the VTVM case.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	21.25MC (Unmod.)	See note under pre-alignment	DC Probe and common leads across R40.	A5,A6	Adjust for MINIMUM deflection.
5.	Direct	"	27.25MC	"	"	A7, A8	"
6.	Direct	"	19.75MC	"	"	A9, A10	"
7.	Direct	"	22.5MC	"	"	A11	Adjust for maximum deflection.
8.	Direct	"	24.6MC	"	"	A12	"
9.	Direct	"	22MC	"	"	A13	"
10.	Direct	"	25.9MC	"	"	A14	"

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	25MC (10MC Sweep)	21.95MC 24.8MC	See note under pre-alignment	Vert. Amp. to Point (D) Low side to chassis.	A15, A16	Shunt the primarys of L25, L26, L28 and L30 (All thru A14) with 300Ω carbon resistors. Adjust A15 and A16 for response curve similar to Fig 3 with markers as shown.
12.	Direct	"	"	21.25MC 22.1MC 25MC 25.75MC 26.5MC	"	"		Remove all 300Ω shunting resistors. Check for response similar to Fig 4 with markers as shown. If necessary retouch A11 thru A16 for proper response.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	.01MFD	High side to pin 2 (Grid) of 12AU7 (V9). Low side to chassis.	4.5MC (400~ Mod.)	Not used	Any	Vert. Amp. to pin 2 (Grid) of picture tube. Low side to chassis.	A17	Adjust for minimum 400~ response on scope, If a wide band scope is not available a VTVM with suitable RF probe may be used. This trap may be adjusted for maximum vertical wedge definition while observing a test pattern from a TV station.

FIG. 1

FIG. 2

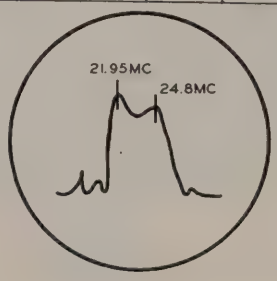


FIG. 3

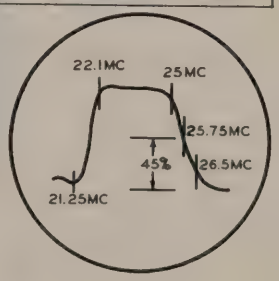


FIG. 4

TV ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

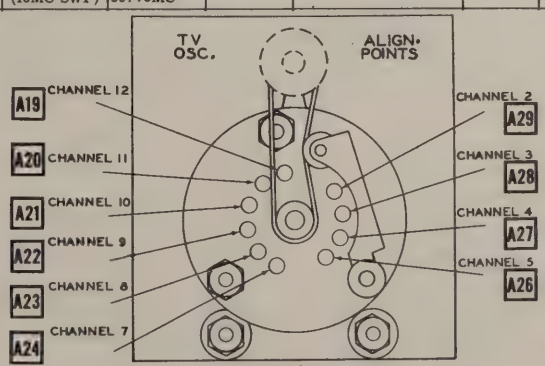
The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Complete oscillator alignment may not be necessary, if all channels seem to be off frequency approximately the same amount, they may be corrected in one step using A18.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
14.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	215.75MC (Unmod.)	13	DC Probe to Point (B) Common to chassis.	A18	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
			209.75MC	12		A19	
			203.75MC	11		A20	
			197.75MC	10		A21	
			191.75MC	9		A22	
			185.75MC	8		A23	
			179.75MC	7		A24	
			87.75MC	6		A25	
			81.75MC	5		A26	
			71.75MC	4		A27	
			65.75MC	3		A28	
			59.75MC	2		A29	

ANTENNA AND RF ALIGNMENT

The antenna and RF section of this receiver is very stable and will not normally require alignment in the field.
Alignment should not be attempted unless they are definitely known to be out of alignment.
Remove the 4.5 volt battery used during video IF alignment and replace it with 3.5 volts battery.
Remove the first video IF Amp. (V4).

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
15.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	177MC (10MC Sweep)	175.25MC 179.75MC	7	Vert. Amp. to Point (E) Low side to chassis.	A30, A31 A32, A33	Adjust for flat-topped response curve similar to Fig 5 with markers above 90%.
16.	"	"	207MC (10MC SWP)	205.25MC 209.75MC	12	"	A30	Adjust A30 for maximum response and minimum slope of top of curve as shown in Fig 6.
17.	"	"	177MC (10MC SWP)	175.25MC 179.75MC	7	"		Check for response similar to Figs. 5, 6, and 7. If markers are below 80% on any channel, make slight adjustment of A31 thru A34 with channel selector set for that channel. Recheck all high band channels to see that they have not been seriously effected.
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			213MC (10MC SWP)	211.25MC 215.75MC	13			
18.	"	"	85MC (10MC SWP)	83.25MC 87.75MC	6	"	A34, A35, A36, A37	Adjust for response curve similar to Fig 6 with markers above 90%.
19.	"	"	79MC (10MC SWP)	77.25MC 81.75MC	5	"		Check for response similar to Fig 6. If markers are below 80% on any channel, make slight adjustment of A35 thru A38 with channel selector set for that channel. Recheck all low band channels to see that they have not been seriously effected.
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			



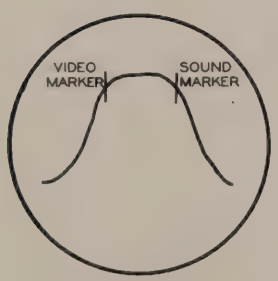


FIG. 5

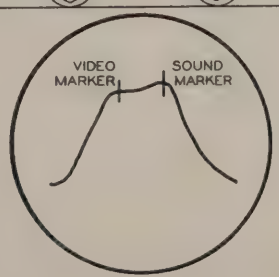


FIG. 6

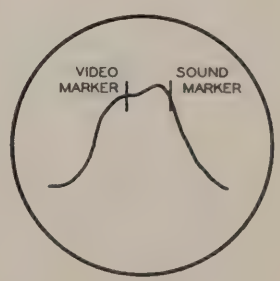


FIG. 7

RADIO ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

If any lead dress is required it should be performed before beginning alignment. (See page 14). The proper order of alignment is given.
If any portion of the receiver is to be aligned, perform all steps after that portion. If the AM IF system is aligned, the FM IF portion will require alignment.
To set pointer turn tuning cap fully closed and set pointer to last reference mark at low frequency end of dial.

AM ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
20	.01MFD	High side to antenna terminal. Low side to chassis.	455KC (400~ Mod.)	AM (second pos. clockwise)	Tuning gang fully closed	Across voice coil	A38, A39, A40, A41	Adjust for maximum output.
21	200MMF	"	1620KC	"	Tuning gang fully open	"	A42	"
22	200MMF	"	1400KC	"	Tune for max. output	"	A43	"
23	200MMF	"	600KC	"	600KC	"	A44, A45	Adjust for maximum output. Repeat steps 21, 22, and 23 until no further improvement can be made.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (± 1%) resistors in series from point to ◇F◇ to chassis. The junction of these two resistors is alignment point ◇H◇ as shown on the schematic.
Alternate loading is used on the transformers during FM IF alignment, that is, the primary of each transformer is shunted with 680 ohms while the secondary of the same transformer is being adjusted. When the primary is to be adjusted, the 680Ω resistor is used to shunt the secondary. This process is repeated for each transformer.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
24	.01MFD	High side to pin 1 (Grid) of 6AU6 (V27). Low side to chassis.	10.7MC (Unmod.)	FM (third position CW)	Tuning gang fully open	DC Probe to Point ◇F◇ Common to chassis.	A46	Adjust for maximum deflection.
25	.01MFD	"	"	"	"	DC Probe to Point ◇G◇ Common to Point ◇H◇	A47	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
26	.01MFD	"	"	"	"	DC Probe to Point ◇F◇ Common to chassis.	A48, A49, A50, A51	Use alternate loading as explained above. Adjust for maximum deflection.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ~ modulation and 450KC sweep. Use 120 ~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
24	Direct	High side to ungrounded tube shield floating over convertor tube (V25). Low side to chassis.	10.7MC (450KC Sweep)	FM (third pos. CW)	Point of non-interference	Vert. Amp. to Point ◇F◇ Low side to chassis.	A46, A48, A49, A50, A51	Disconnect stabilizer capacitor (C107). Adjust for maximum amplitude and symmetry as per Fig 9.
25	"	"	"	"	"	Vert. Amp. to Point ◇H◇ Low side to chassis.	A47, A46	Reconnect capacitor (C107). Adjust A47 so 10.7MC occurs at center of crossover lines as per Fig 10. Slightly retouch A46 for maximum amplitude and straightness of crossover lines. Continue with step 27.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
27	270Ω carbon res.	High side thru 270Ω to ungrounded antenna terminal. Low side to chassis.	106MC (Unmod.)	FM	106MC	DC Probe to Point ◇F◇ Low side to chassis.	A52, A53	Set A52 to maximum capacity. Expand or compress turns of A53 for maximum deflection, then adjust A52 for maximum deflection.
28	"	"	90MC	"	Tune for max. deflection.	"	A54	Expand or compress coil turns for maximum deflection. Repeat steps 27 and 28 until no further improvement can be made.

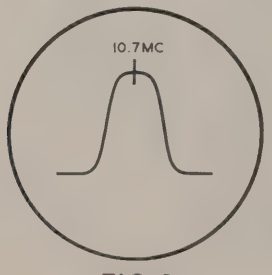


FIG. 9

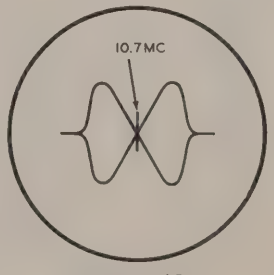
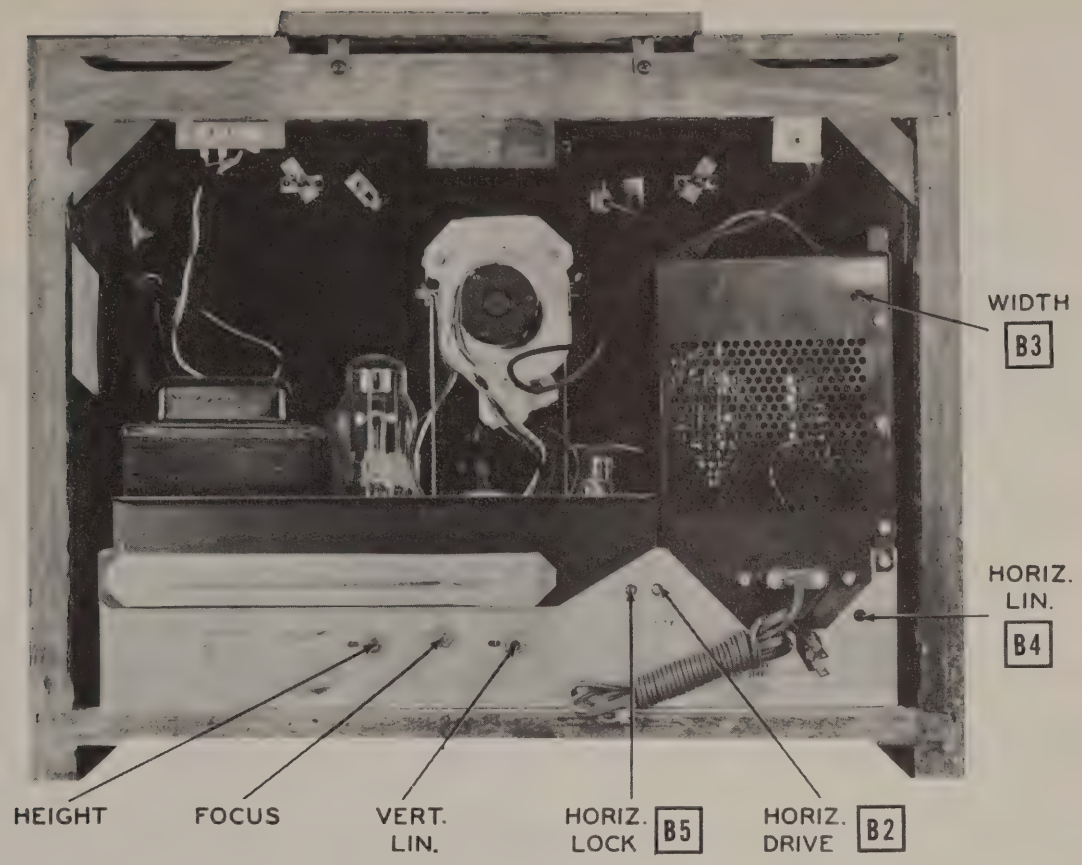


FIG. 10



CABINET-REAR VIEW

AGC THRESHOLD ADJUSTMENT

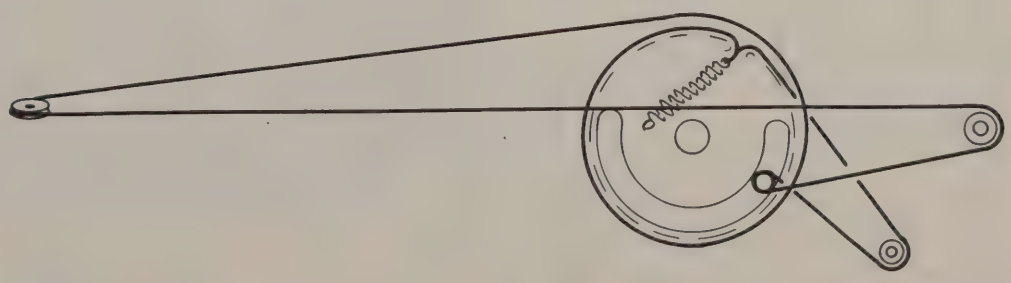
Turn the set on and tune in a local TV station.

Turn the contrast control to maximum clockwise.

Turn the AGC threshold control to maximum counter-clockwise, a bend may appear in the upper part of the picture.

Turn the AGC threshold control clockwise until there is a very slight bend, or slight change of the bend which may already be there. Then turn the AGC threshold control slowly counter-clockwise until the slight bend, or change of bend disappears.

Turn the contrast control to approximately the center of its range. The picture should be of proper contrast.



DIAL CORD STRINGING

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	.5VDC	0V.	0V.	6.3VAC	145VDC	140VDC	0V.		
V 2	6AG5	0V.	0V.	0V.	6.3VAC	115VDC	115VDC	0V.		
V 3	6J6	68VDC	68VDC	6.3VAC	0V.	§-3.3VDC	§-3.6VDC	.2VDC		
V 4	6AG5	-.1VDC	.4VDC	0V.	6.3VAC	95VDC	95VDC	.4VDC		
V 5	6AG5	0V.	.6VDC	6.3VAC	0V.	100VDC	100VDC	.6VDC		
V 6	6AG5	0V.	.4VDC	0V.	6.3VAC	62VDC	100VDC	.4VDC		
V 7	6AG5	0V.	1.2VDC	6.3VAC	0V.	155VDC	115VDC	1.2VDC		
V 8	6AL5	▲.2VDC	¶-1.5VDC	0V.	6.3VAC	¶0V.	0V.	▲-.1VDC		
V 9	12AU7	▲105VDC	▲-3.1VDC	▲.4VDC	6.3VAC	6.3VAC	▲200VDC	▲115VDC	▲115VDC	0V.
V 10	6AU6	0V.	0V.	0V.	6.3VAC	105VDC	105VDC	.6VDC		
V 11	6AU6	-.3VDC	0V.	0V.	6.3VAC	110VDC	60VDC	0V.		
V 12	6AL5	0V.	-.6VDC	1.3VAC	6.3VAC	0V.	0V.	-.5VDC		
V 13	6AV6	-.6VDC	0V.	0V.	6.3VAC	.4VDC	.4VDC	80VDC		
V 14	6V6GT	0V.	0V.	▲190VDC	▲200VDC	▲0V.	▲112VDC	6.3VAC	▲11VDC	
V 15	6SN7GT	▲-55VDC	▲90VDC ▲320VDC	▲0V.	¶-15VDC	¶57VDC	¶0V.	6.3VAC	0V.	
V 16	6SN7GT	¶37VDC	¶132VDC	¶50VDC	¶40VDC	¶132VDC	¶50VDC	6.3VAC	0V.	
V 17	6SN7GT	-1.1VDC	140VDC	0V.	¶-1.5VDC	¶270VDC	¶1.8VDC	6.3VAC	0V.	
V 18	6K6GT	0V.	0V.	▲320VDC	▲320VDC	▲0V.	▲30VDC ▲0V	6.3VAC	▲45VDC ▲35VDC	
V 19	6SN7GT	▲-2.4VDC	▲100VDC	▲-17VDC	▲-42VDC	▲165VDC	▲0V.	6.3VAC	0V.	
V 20	6BG6G	0V.	0V.	▲8.8VDC	▲-.7VDC	▲0V.	▲8.8VDC	6.3VAC	▲260VDC	TOP CAP *
V 21	5V4G	0V.	290VDC	0V.	235VDC	0V.	235VDC	0V.	290VDC	
V 22	1B3GT	* DO NOT MEASURE.								
V 23	5U4G	0V.	250VDC	0V.	390VAC	0V.	390VAC	0V.	250VDC	
V 24	10BP4	0V.	▲80VDC	PIN 10 270VDC	PIN 11 90VDC	PIN 12 6.3VAC				
♦ V25	6J6	105VDC	100VDC	0V.	6.3VAC	§-9.5VDC	0V.	0V.		
† V25	6J6	90VDC	65VDC	0V.	6.3VAC	§-5.8VDC	0V.	0V.		
♦ V26	6BA6	-.1VDC	0V.	0V.	6.3VAC	185VDC	105VDC	.6VDC		
† V27	6AU6	0V.	0V.	0V.	6.3VAC	175VDC	140VDC	1.1VDC		
† V28	6AL5	.1VDC	-.5VDC	6.3VAC	0V.	-.2VDC	0V.	-.2VDC		
♦ V29	6AV6	0V.	0V.	6.3VAC	0V.	-.3VDC	-.3VDC	0V.		

§ TAKEN WITH VACUUM TUBE VOLTMETER.
▲ MEASURED FROM PIN 6 OF V19.
¶ MEASURED FROM PIN 6 OF V15.
♦ TAKEN IN AM POSITION.
† TAKEN IN FM POSITION.

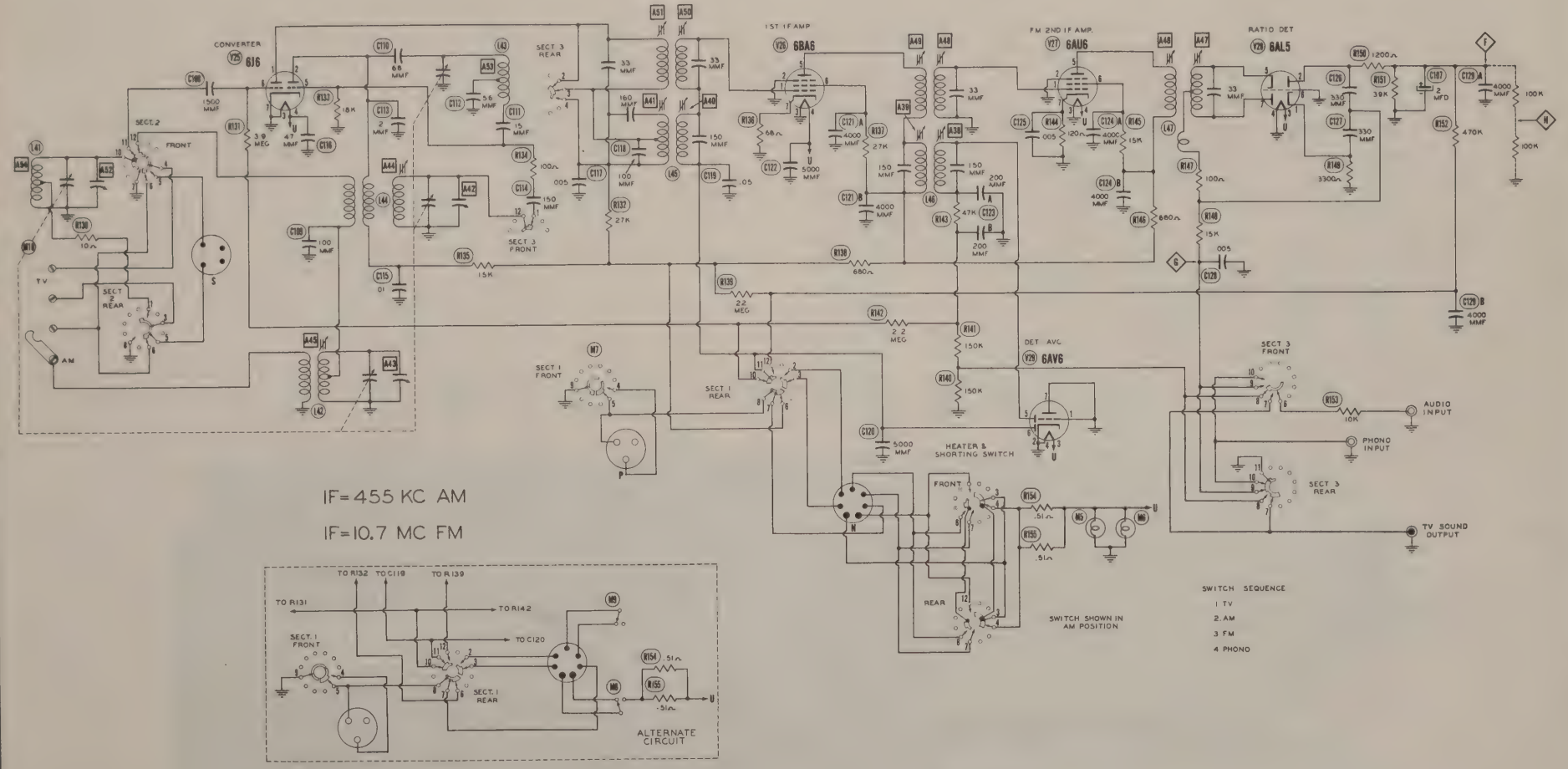
RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	150KΩ	0Ω	0Ω	.1Ω	†3.8KΩ	†1.[illegible]KΩ	0Ω		
V 2	6AG5	100KΩ	0Ω	0Ω	.1Ω	†2KΩ	†2KΩ	0Ω		
V 3	6J6	†11KΩ	†11KΩ	.1Ω	0Ω	100KΩ	100KΩ	47Ω		
V 4	6AG5	[illegible].5KΩ	39Ω	0Ω	.1Ω	†2.5KΩ	†2.5KΩ	39Ω		
V 5	6AG5	10KΩ	68Ω	.1Ω	0Ω	†2.5KΩ	†2.5KΩ	68Ω		
V 6	6AG5	5.5KΩ	39Ω	0Ω	.1Ω	†8KΩ	†2KΩ	39Ω		
V 7	6AG5	.1Ω	150Ω	.1Ω	0Ω	†8KΩ	†2KΩ	150Ω		
V 8	6AL5	▲10Ω	¶3.9 Meg.	0Ω	.1Ω	¶0Ω	0Ω	▲5.6KΩ		
V 9	12AU7	5.5KΩ	▲5.6KΩ	▲100Ω	.1Ω	.1Ω	†14KΩ	3.3KΩ	▲12KΩ	0Ω
V 10	6AU6	.1Ω	0Ω	0Ω	.1Ω	†2.2KΩ	†2.2KΩ	82Ω		
V 11	6AU6	22KΩ	0Ω	0Ω	.1Ω	†2KΩ	†23KΩ	0Ω		
V 12	6AL5	0Ω	100KΩ	2Ω	.1Ω	200KΩ	0Ω	100KΩ		
V 13	6AV6	10 Meg.	0Ω	0Ω	.1Ω	150KΩ	150KΩ	†330KΩ		
V 14	6V6GT	Inf.	0Ω	†3KΩ	†2.6KΩ	▲470KΩ	10Ω	.1Ω	▲490Ω	
V 15	6SN7GT	▲2.5 Meg.	#1.5Meg. #270KΩ	▲0Ω	▲300KΩ	24KΩ	¶0Ω	.1Ω	0Ω	
V 16	6SN7GT	160KΩ	†30KΩ	330KΩ	11KΩ	†7.5KΩ	100KΩ	.1Ω	0Ω	
V 17	6SN7GT	1 Meg.	†15KΩ	0Ω	¶3.9Meg.	†220Ω	¶6.8KΩ	.1Ω	0Ω	
V 18	6K6GT	Inf.	0Ω	†1.8KΩ	†1.8KΩ	▲2.2 Meg.	▲5KΩ ▲0Ω	.1Ω	▲7.7KΩ ▲2.7KΩ	
V 19	6SN7GT	▲ 1 Meg.	#180KΩ	▲300KΩ	▲250KΩ	†130KΩ	▲0Ω	.1Ω	0Ω	
V 20	6BG6G	Inf.	0Ω	▲86Ω	▲180KΩ	▲1 Meg.	▲86Ω	.1Ω	†10KΩ	TOP CAP #200Ω
V 21	5V4G	Inf.	200KΩ	Inf.	†560Ω	Inf.	†560Ω	Inf.	200KΩ	
V 22	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #350Ω
V 23	5U4G	Inf.	6KΩ	Inf.	1.2KΩ	Inf.	1.2KΩ	Inf.	6KΩ	
V 24	10BP4	0Ω	2.2 Meg.	PIN 10 56KΩ	PIN 11 12KΩ	PIN 12 .1Ω				
♦ V25	6J6	†27KΩ	†15KΩ	0Ω	.1Ω	18KΩ	6.5 Meg.	0Ω		
† V25	6J6	†27KΩ	†15KΩ	0Ω	.1Ω	18KΩ	6.5 Meg.	0Ω		
♦ V26	6BA6	2.5 Meg.	0Ω	0Ω	.1Ω	†1000Ω	†27KΩ	[illegible]8Ω		
† V27	6AU6	.2Ω	0Ω	0Ω	.1Ω	†1.6KΩ	†16KΩ	120Ω		
† V28	6AL5	3.3KΩ	40KΩ	.1Ω	0Ω	Inf.	0Ω	Inf.		
♦ V29	6AV6	0Ω	0Ω	.1Ω	0Ω	350KΩ	2.6 Meg.	0Ω		

† MEASURED FROM PIN 8 OV V23.
# MEASURED FROM PIN 8 OF V21.
▲ MEASURED FROM PIN 6 OF V19.
¶ MEASURED FROM PIN 6 OF V15.
♦ TAKEN IN AM POSITION.
† TAKEN IN FM POSITION.

NOTE: AGC THRESHOLD CONTROL SET AT MAXIMUM FOR THESE MEASUREMENTS.

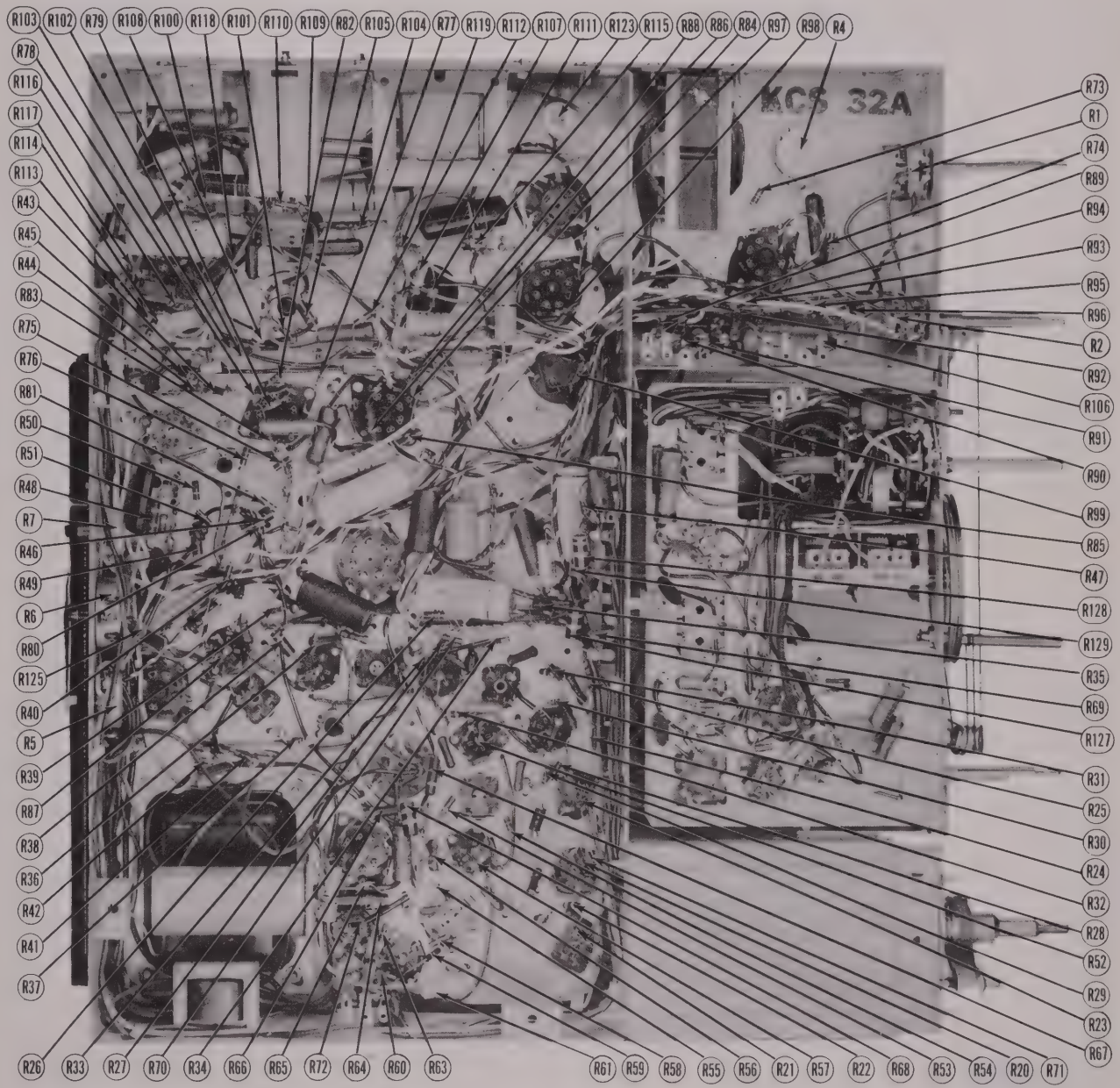
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



88-9

AM-FM TUNER SCHEMATIC

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

BLOCK DIAGRAM
RF AMP. V1
CONV. V2
OSC V3
1st VIDEO IF V4
2nd VIDEO IF V5
3rd VIDEO IF V6
4th VIDEO IF V7
SOUND IF V10
LIMITER V11
DISCRIMINATOR V12
AF AMP. 1/2 V13
AUDIO OUTPUT V14
AGC RECT. 1/2 V16
AGC AMP. 1/2 V15
BIAS CLAMPER 1/2 V13
AGC
VIDEO DET. 1/2 V8
VIDEO AMP. V9
1st SYNC SEP. 1/2 V16
SYNC AMP. 1/2 V17
2nd SYNC SEP. 1/2 V17
VERT. OSC & DISCH. 1/2V15
VERT OUTPUT V18
HOR. AFC 1/2 V19
HOR. OSC. 1/2 V19
HOR. OUTPUT V20
DAMPER V21
HV RECT. V22
8.4KV
V24
LV RECT. V23
B++
B+
B-

HORIZONTAL OSCILLATOR ADJUSTMENTS

HORIZONTAL FREQUENCY ADJUSTMENT

Connect a jumper across terminals "C" and "D" of the horizontal oscillator transformer T3. Tune in a station and, if possible, sync the picture and proceed as follows:

1. Turn horizontal hold control fully clockwise. Adjust the Frequency Adjustment (B1) so picture is just out of sync and the horizontal blanking appears as a vertical bar.

2. Turn the hold control approximately a quarter of a turn from the fully clockwise position and notice the picture width and linearity. If the width and linearity is incorrect, adjust the horizontal drive (B2), width (B3) and horizontal linearity (B4) controls until the picture is correct. If B2, B3, or B4 required adjustment repeat stpp 1 above.

HORIZONTAL LOCKING RANGE ADJUSTMENT

Turn the horizontal hold control fully counterclockwise. Remove signal momentarily by turning channel switch to another channel and back again. Slowly turn the hold control clockwise and note the number of diagonal bars that appear just before the picture "syncs".

If more than 9 bars are present just before synchronization, turn the horizontal locking range trimmer (B5) slightly clockwise. If less than 7 bars are present, turn B5 slightly counterclockwise.

Turn the hold control counterclockwise and momentarily interrupt the signal and check the number of bars present at the pull-in point. Repeat this procedure until 7 to 9 bars are present.

HORIZONTAL OSCILLATOR WAVEFORM ADJUSTMENT

Remove the jumper across terminals "C" and "D" of T3. Turn the horizontal hold control fully counterclockwise. Adjust B6 with a non-metallic screwdriver until the horizontal blanking bar is present on the raster.

Connect the low capacity probe of an oscilloscope to terminal "C" of T3. Turn the horizontal hold control one quarter of a turn from the clockwise position until the picture syncs. The pattern on the scope should be similar to Fig 8. Adjust B6 until the broad and narrow peaks are of the same amplitude (If necessary, while making this adjustment turn the hold control to keep the picture in synchronization).

This adjustment must be carefully made to assure correct circuit operation. If the broad peak is lower in amplitude than the sharp peak, the oscillator drift becomes greater and the circuit has greater susceptibility to noise pluses. However, if the broad peak is greater in amplitude than the sharp peak, the oscillator is overstabilized, the pull-in range inadequate, and there is the possibility of double triggering of the oscillator as the horizontal hold control approaches the extreme clockwise position.

HORIZONTAL OSCILLATOR ADJUSTMENTS CHECK

Turn the horizontal hold control fully counterclockwise. Momentarily remove the signal and then slowly turn the hold control clockwise and note the number of bars present just before the picture synchronizes.

If more than 3 bars are present, turn B5 slightly clockwise. If less than 3 bars are present, turn B5 slightly counterclockwise. Momentarily remove the signal and recheck the number of bars present at the pull-in point. Repeat this procedure until 3 bars are present just before synchronization occurs.

Turn the horizontal hold control fully clockwise. The picture should be just out of synchronization to the extent that the horizontal blanking bar appears as a single vertical or diagonal bar in the picture. Retouch B6 until this condition exists.

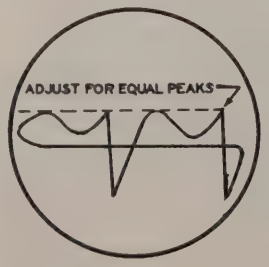


FIG. 8

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: RCA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6AG5	6AG5	7BD	
V2	Mixer	6AG5	6AG5	7BD	
V3	Oscillator	6J6	6J6	7BF	
V4	1st Video IF	6AG5	6AG5	7BD	
V5	2nd Video IF	6AG5	6AG5	7BD	
V6	3rd Video IF	6AG5	6AG5	7BD	
V7	4th Video IF	6AG5	6AG5	7BD	
V8	Video Det. -Sync. Clamper	6AL5	6AL5	6BT	
V9	Video Amp.	12AU7	12AU7	9A	
V10	Sound IF Amp.	6AU6	6AU6	7BK	
V11	Limiter	6AU6	6AU6	7BK	
V12	Disc.	6AL5	6AL5	6BT	
V13	AF Amp. -Bias Clamper	6AV6	6AV6	7BT	
V14A	Audio Output	6V6GT	6V6GT	7AC	Used in chassis KCS32B or C.
B	Audio Output	6K6GT	6K6GT	7S	Used in chassis KCS30 or A.
V15	AGC Amp. -Vert. Osc. & Disch.	6SN7GT	6SN7GT	8BD	
V16	AGC Rectifier-1st Sync. Sep.	6SN7GT	6SN7GT	8BD	
V17	Sync. Amp. -2nd Sync. Sep.	6SN7GT	6SN7GT	8BD	
V18	Vert. Output	6K6GT	6K6GT	7S	
V19	Hor. AFC-Hor. Osc.	6SN7GT	6SN7GT	8BD	
V20	Hor. Output	6BG6G	6BG6G	5BT	
V21	Damper	5V4G	5V4G	5L	
V22	HV Rectifier	1B3GT	1B3GT	3C	
V23	LV Rectifier	5U4G	5U4G	5T	
V24	Picture Tube	10BP4	10BP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: RCA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	73582	AFH82J16E	UP9CJ915		TVL-25	▲ Filter
B	10	450						■ Output Decoupling
C	80	200						▲ Filter
C2A	40	450	73583	AFH8J1810D	UP9CJ913		TVL-27	▲ Filter
B	90	150						■ Vert. Output Cath. Bypass
C	50	150						▲ Filter
C3A	60	450	73581	AFH1222J4D	UP9DJ914		TVL-68	▲ Filter
B	10	450						■ Decoupling
C	10	450						▲ Decoupling
D	20	150						Output Cath. Bypass
C4A	40	450	71432	AFH882J	UP9CJ897		TVL-30	▲ Filter
B	40	450						■ Filter
C	10	450						▲ Vert. Output Decoupling
C5	25	50	53147	PRS50/25	BR255		TVA-15	AGC Filter
C6	5	50	74106	PRS150/4	BR550		TVA-13	AGC Filter
C7	18		54207					Fixed Trimmer
C8	270	500	73091			GP2K-270		RF Coupling
C9	1500		53494	GP1500M		GP2L-0015		AGC Filter
C10	1500		53494	GP1500M		GP2L-0015		RF Screen Bypass
C11	1500		53494	GP1500M		GP2L-0015		RF Bypass
C12	1500		53494	GP1500M		GP2L-0015		RF Coupling
C13	5000		73473	BPD-5		811-005	29C1	RF Coupling
C14	1500		53494	GP1500M		GP2L-0015		RF Filament Bypass
C15	1500		53494	GP1500M		GP2L-0015		Conv. Filament Bypass
C16	1500		53494	GP1500M		GP2L-0015		Conv. Decoupling
C17	1500		53494	GP1500M		GP2L-0015		RF Bypass
C18	10		53511	C10JNPO		NPOK-10		Fixed Trimmer
C19	5		74035	CN5DNPO		NPOK-5		Osc. Feedback
C20	5		74035	CN5DNPO		NPOK-5		Osc. Feedback
C21	1500		53494	GP1500M		GP2L-0015		Osc. Filament Bypass
C22	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	RF Bypass
C23	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	AGC Filter
C24	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	1st V. IF Decoupling
C25	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	1st V. IF Fil. Bypass
C26	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	RF Bypass
C27	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	RF Bypass
C28	270	1000	73091	1468-00025	5W5T25	GP2K-270	1FM-325	IF Coupling
C29	82							Fixed Trimmer
C30	47			C147KNPO	5R5Q5	NPOM-50	MS-45	Fixed Trimmer
C31	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	2nd V. IF Decoupling
C32	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	2nd V. IF Fil. Bypass
C33	33	1000	74105	1468-00004	5W5Q4	GP1K-33	1FM-44	IF Coupling
C34	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	AGC Filter
C35	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	RF Bypass
C36	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	3rd V. IF Decoupling
C37	270	1000	73091	1468-00025	5W5T25	GP2K-270	1FM-325	IF Coupling
C38	47			C147JNPO	5R5Q5	NPOM-50	MS-45	Fixed Trimmer
C39	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	RF Bypass
C40	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	4th V. IF Screen Bypass
C41	75			CN75J75		NPOM-75		Fixed Trimmer
C42	82		64062	GP100M	5W5T1	GP1K-100	1FM-31	4th V. IF Cath. Bypass
C43	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	4th V. IF Plate Dec.
C44	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	RF Bypass
C45	270	1000	73091	1468-00025	5W5T25	GP2K-270	1FM-325	IF Coupling
C46	10	500	72615	1468-00001	5W5T1	GP1K-10	MS-41	V. Diode Filter
C47	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	RF Bypass
C48	560	500	39646	1468-0005	1W5T6	GP2K-560	1FM-35	1st V. Amp. Cath. Bypass
C49	560	500	39646	1468-0005	1W5T6	GP2K-560	1FM-35	2nd V. Amp. Cath. Bypass
C50	270		73922	GP270M		GP2K-270		Video Coupling
C51	47			CN47JNPO	5R5Q5	NPOM-50	MS-45	Fixed Trimmer
C52	120		73921	GP120M		GP2K-120		Video Coupling
C53	.047	400	73553	P488-047	PTE4S5		TM-15	Video Coupling

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA RCA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C54	.1	600	73557	P688-1	PTE6P1		TM-1	Pic. Tube Cath. Dec.
C55	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	1st S. IF Cath. Bypass
C56	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	1st S. IF Decoupling
C57	100		39396	GP100M	5W5T1	GP1K-100	1FM-31	Limiter Grid Filter
C58	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	Limiter Screen Bypass
C59	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	Limiter Filament Bypass
C60	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	Limiter Plate Bypass
C61	270		73922	GP270M	5W5T25	GP2K-270	1FM-325	RF Bypass
C62	.001	600	73801	P688-001	PTE6D1	GP2L-001	TM-21	De-emphasis
C63	270		73922	GP270M	5W5T25	GP2K-270	1FM-325	Disc. Filament Bypass
C64	.0022	600	73803	P688-0022	PTE6D2	GP2M-0022	TM-22	Audio Coupling
C65	.0047	600	73550	P688-0047	PTE6D5	GP2M-0047	TM-25	Tone Compensation
C66	.01	400	73561	P488-01	PTE4S1	GP2-335-01	TM-11	Audio Coupling
C67	.0047	600	73550	P688-0047	PTE6D5	GP2M-0047	TM-25	Tone Compensation
C68	470	500	39644	1468-0005	5W5T5	GP2K-470	1FM-35	Tone Compensation
C69	.01	1000	73565	P1088-01	PTE16S1		MB-11	Audio Coupling
C70	.0047	600	73550	P688-0047	PTE6D5	GP2M-0047	TM-25	Output Plate Bypass
C71	.47	200	73787	P288-47	GT2P5		TC-5	AGC Filter
C72	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	AGC Filter
C73	.047	200	73558	P288-047	PTE4S5		TM-15	AGC Amp. Grid Filter
C74	.01	400	73561	P488-01	PTE4S1	GP2-335-01	TM-11	AGC Rect. Cath. Bypass
C75	.001	600	73801	P688-001	PTE6D1	GP2L-001	TM-21	Sync. Coupling
C76	.22	200	73560	P488-22	GT2P25		TC-2	1st Sync. Sep. Cath. Bypass
C77	.047	400	73553	P488-047	PTE4S5		TM-15	Sync. Coupling
C78	100	500	39628	1468-0001	5W5T1	GP1K-100	1FM-31	Sync. Coupling
C79	390	500	39642	1468-0004	5W5T4	GP2K-390	1FM-34	2nd Sync. Sep. Cath. Bypass
C80	.0022	600	73803	P688-0022	PTE6D2	GP2M-0022	TM-22	Integrator Net.
C81	.0047	600	73550	P688-0047	PTE6D5	GP2M-0047	TM-25	Integrator Net.
C82	.0047	600	73550	P688-0047	PTE6D5	GP2M-0047	TM-25	Integrator Net.
C83	.0047	600	73920	P688-0047	PTE6D5	GP2M-0047	TM-25	Vert. Osc. Grid Cap.
C84	.047	600	73592	P688-047	PTE6S5		TM-15	Vert. Discharge
C85	.1	400	73551	P488-1	PTE4P1		TM-1	Vert. Sweep Coupling
C86	.047	200	73558	P288-047	PTE4S5		TM-15	Isolation
C87	180	500	51416	1468-0002	5W5T2	GP2K-180	1FM-32	Hor. Sync. Coupling
C88	.0022	600	73803	P688-0022	PTE6D2	GP2M-0022	TM-22	Hor. Sync. Coupling
C89	.047	600	73592	P688-047	PTE6S5		TM-15	Hor. AFC Plate Bypass
C90	.22	400	73794	P488-22	GT4P25		TC-2	AFC Filter
C91	.022	400	73562	P488-022	PTE4S2		TM-12	AFC Filter
C92	180	1000	73102					Hor. Osc. Grid Cap.
C93	10000	500	73594	1467-01	1D3S1	GP2-335-01	1FM-11	Fixed Trimmer
C94	2200	500	73595			GP2M-0022		Hor. Discharge
C95	390	500	39642	1468-0004	5W5T4	GP2K-390	1FM-34	Hor. Sweep Coupling
C96	.047	1000	73564	P1088-047	GT16S5		TR-15	Hor. Output Screen Bypass
C97	.22	400	73794	P288-22	GT4P25		TC-2	Hor. Output Cath. Bypass
C98	.047	400	73553	P488-047	PTE4S5		TM-15	Bias Filter
C99	.033	1000	73596	P1088-033				Damper Filter
C100	.047	1000	73597	P1088-047	GT16S5		TR-15	Damper Filter
C101	5	1500	72809					Hor. Feedback
C102	500	20000	71450			410-500		HV Filter
C103	.01	400	73561	P488-01	PTE4S1	GP2-335-01	TM-11	Line Filter
C104	.01	400	73561	P488-01	PTE4S1	GP2-335-01	TM-11	Line Filter
C105	.47	200	73787	P288-47	GT2P5		TC-5	Hor. Sweep Coupling ‡
C106	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	AGC Filter

‡ Not used in all models.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.	1/2	72734	B11-137 *	970111-24	Vert. hold control, front
B	50KΩ	1/2		B11-123 *		Horiz. hold control, rear
C	Shaft End			E187 *		Attach per instructions in "Concentrikit".
R2A	50KΩ	1/2	74047	B11-123 *	970913-11	Brightness control, front
B	10KΩ	1/2		B17-116 *		Contrast control, rear
C	Shaft End			E187 *		Attach per instructions in "Concentrikit".
R3A	500KΩ	1/2	74048	B13-133 *	970913-10	Tone control, front
B	1 Meg.	1/2		B13-137X *		Volume control, rear tapped at 200KΩ
C	Shaft End			E187 *		Attach per instructions in "Concentrikit".
D	Switch			76-1 *		Attach per instructions in "Concentrikit".
R4	200KΩ	1/2	73579	Q11-130	M-52-S	AGC Threshold control
R5	2.5 Meg.	1/2	71440	Q11-239	M-84-S	Height control
R6A	5000Ω	4	74442		10-5000	Focus control, Wire Wound
B	2250Ω	4	72735		10-2500	Focus control, Wire Wound-See Note
R7	5000Ω	1/2	71441	Q11-114	M-19-S	Vert. linearity control

* Additional parts to be used with "Concentrikit".
NOTE - Used only on chassis KCS-32 and KCS-32A.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R8	1000Ω	1/2		BTS-1000	RF Grid
R9	150Ω 20%	1/2			AGC Network
R10	150Ω 20%	1/2			RF Screen Decoupling
R11	2700Ω	1/2		BTS-2700	RF Plate
R12	100KΩ 20%	1/2		BTS-100K	Series Test Connection
R13	100KΩ 20%	1/2			Mixer Grid
R14	150Ω 20%	1/2			Mixer Decoupling
R15	1000Ω 20%	1/2		BTS-1000	Decoupling Network
R16	47Ω 20%	1/2			Osc. Cathode
R17	100KΩ 20%	1/2		BTS-100K	Osc. Grid
R18	100KΩ 20%	1/2		BTS-100K	Osc. Grid
R19	10KΩ 20%	1/2		BTS-10K	Osc. Plate
R20	150Ω 20%	1/2			Decoupling Network
R21	22KΩ 20%	1/2		BTS-22K	1st Video IF Transformer Shunt See Note 1
R22	39Ω	1/2			1st Video IF Cathode
R23	1000Ω 20%	1/2		BTS-1000	1st Video IF Decoupling
R24	150Ω 20%	1/2			Decoupling Network
R25	1000Ω 20%	1/2		BTS-1000	AGC Network
R26	18KΩ 5%	1/2		BTS-18K-5%	AGC Network
R27	5600Ω 5%	1/2		BTS-5600-5%	Voltage Divider
R28	10KΩ 5%	1/2			2nd Video IF Grid
R29	68Ω	1/2			2nd Video IF Cathode
R30	1000Ω 20%	1/2		BTS-1000	2nd Video IF Decoupling
R31	150Ω 20%	1/2			Decoupling Network

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA PART No.	IRC PART No.
R32	39Ω	1/2		
R33	5600Ω 5%	1/2		BTS-1000
R34	1000Ω 20%	1/2		
R35	150Ω 20%	1/2		BTS-1000
R36	1000Ω 20%	1/2		
R37	150Ω	1/2		
R38	6800Ω 5%	1		BTS-1000
R39	1000Ω 20%	1/2		BTS-5600-5%
R40	5600Ω 5%	1/2		BW-1/2-10
R41	10Ω 20%	1/2		BW-1/2-100
R42	100Ω	1/2		BTS-2200
R43	2200Ω	1/2		BTS-3300-5%
R44	3300Ω 5%	1/2		BTS-220K
R45	220KΩ	1/2		BT-2-12K
R46	12KΩ	2		BW-1/2-220
R47	220Ω	1/2		BTA-5600
R48	5600Ω	1		BTA-8200-5%
R49	8200Ω 5%	1		BTS-2.2 Meg.
R50	2.2 Meg.	1/2		BTS-2.2 Meg.
R51	2.2 Meg.	1/2		
R52	82Ω	1/2		BTS-1200
R53	1200Ω	1/2		BTS-22K
R54	22KΩ	1/2		BTS-1000
R55	1000Ω 20%	1/2		BTS-22K
R56	22KΩ 20%	1/2		BTS-47K
R57	47KΩ 20%	1/2		BTS-100K-5%
R58	100KΩ 5%	1/2		BTS-100K-5%
R59	100KΩ 5%	1/2		BTS-22K
R60	22KΩ 20%	1/2		BW-1/2-4.7
R61	5.1Ω	1/2	72067	BTS-82K
R62	82KΩ	1/2		BTS-10 Meg.
R63	10 Meg. 20%	1/2		BTS-330K
R64	330KΩ	1/2		BTS-470K
R65	470KΩ 20%	1/2		BW-1-220
R66	220Ω	1		BW-1-270
R67	270Ω	1		BT-2-1800
R68	1800Ω	2		BTS-12K
R69	12KΩ	1/2		BTS-120K
R70	120KΩ	1/2		BTS-8200-5%
R71	8200Ω 5%	1/2		BTS-1.8 Meg.
R72	1.8 Meg. 5%	1/2		BTS-470K
R73	470KΩ	1/2		BTS-470K
R74	470KΩ	1/2		BTS-100K
R75	100KΩ	1/2		BTS-2700
R76	2700Ω	1/2		BTS-4700
R77	4700Ω	1/2		BTS-5600
R78	5600Ω	1/2		BTS-150K
R79	150KΩ	1/2		BTS-330K
R80	330KΩ	1/2		BTS-5600
R81	5600Ω	1/2		BTS-27K
R82	27KΩ	1/2		BTS-47K
R83	47KΩ	1/2		BTS-10 Meg.
R84	10 Meg.	1/2		BTS-1 Meg.
R85	1 Meg.	1/2		BTA-15K
R86	15KΩ	1		BTS-3.9 Meg.
R87	3.9 Meg.	1/2		BTS-6800
R88	6800Ω	1/2		BTS-22K
R89	22KΩ	1/2		BTS-8200
R90	8200Ω	1/2		BTS-8200
R91	8200Ω	1/2		BTS-1.5 Meg.
R92	1.5 Meg. 5%	1/2		BTS-220K
R93	220KΩ	1/2		BTS-2.2 Meg.
R94	2.2 Meg.	1/2		BTS-100K
R95	100KΩ	1/2		BTS-8200-5%
R96	8200Ω 5%	1/2		BTS-2.2 Meg.
R97	2.2 Meg.	1/2		BTS-2700
R98	2700Ω	1/2		BTS-1000
R99	1000Ω 20%	1/2		BTS-56K
R100	56KΩ	1/2		BTS-820K-5%
R101	820KΩ 5%	1/2		BTS-150K
R102	150KΩ	1/2		BTA-150K-5%
R103	150KΩ 5%	1		BTS-8200
R104	8200Ω	1/2		BTA-2.7Meg.
R105	2.7 Meg. 5%	1		BTS-68K
R106	68KΩ	1/2		BTA-120K
R107	120KΩ	1		BTA-100K-5%
R108	100KΩ 5%	1		BTS-8200-5%
R109	8200Ω 5%	1/2		BTS-22K
R110	22KΩ	1/2		BTA-120K
R111	120KΩ	1		BTS-150K
R112	150KΩ	1/2		
R113	47Ω 20%	1/2		BTS-820K
R114	820KΩ	1/2		BTS-180K
R115	180KΩ	1/2		BW-1-39
R116	39Ω	1		BW-1-47
R117	47Ω	1		BT-2-10K
R118	10KΩ	2		BTS-10K
R119	10KΩ	1/2		
R120	3.3Ω	1/2	71513	
R121	1 Meg. 20%	1		BTS-560K
R122	560KΩ	1/2		DG-500
R123	500Ω	20	74049	
R124	10Ω	1/2		BW-2-390
R125	390Ω	2	72325	DG-850
R126A	850Ω	10	73588	
B	650Ω	6		
C	650Ω	6		
R127	1800Ω	2		BT-2-1800
R128	6800Ω	2		BT-2-6800
R129	6800Ω	2		BT-2-6800

Note 1. Some models use 10KΩ resistor in this applicat
Note 2. Used only on chassis KCS32B and KCS23C.
Note 3. Some models use 560KΩ resistor in this applica
Note 4. Some models use 6800Ω resistor in this applica
Note 5. Not used in all models.
Note 6. Some models use 330Ω resistor in this applicat

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA RCA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C54	.1	600	73557	P488-1	PTE6P1		TM-1	Pic. Tube Cath. Dec.
C55	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	1st S. IF Cath. Bypass
C56	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	1st S. IF Decoupling
C57	100		39396	GP100M	5W5T1	GP1K-100	1FM-31	Limiter Grid Filter
C58	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	Limiter Screen Bypass
C59	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	Limiter Filament Bypass
C60	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	Limiter Plate Bypass
C61	270		73932	GP270M	5W5T25	GP2K-270	1FM-325	RF Bypass
C62	.001	600	73801	P488-001	PTE6D1	GP2L-001	TM-21	De-emphasis
C63	270		73922	GP270M	5W5T25	GP2K-270	1FM-325	Disc. Filament Bypass
C64	.0022	600	73803	P488-0022	PTE6D2	GP2M-0022	TM-22	Audio Coupling
C65	.0047	600	73550	P488-0047	PTE6D5	GP2M-0047	TM-25	Tone Compensation
C66	.01	400	73561	P488-01	PTE4S1	GP2-335-01	TM-11	Audio Coupling
C67	.0047	600	73550	P488-0047	PTE6D5	GP2M-0047	TM-25	Tone Compensation
C68	470	500	39644	1468-0005	5W5T5	GP2K-470	1FM-35	Tone Compensation
C69	.01	1000	73565	P1068-01	PTE16S1		MB-11	Audio Coupling
C70	.0047	600	73550	P488-0047	PTE6D5	GP2M-0047	TM-25	Output Plate Bypass
C71	.47	200	73787	P288-47	GT2P5		TC-5	AGC Filter
C72	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	AGC Filter
C73	.047	200	73558	P288-047	PTE4S5		TM-15	AGC Amp. Grid Filter
C74	.01	400	73561	P488-01	PTE4S1	GP2-335-01	TM-11	AGC Rect. Cath. Bypass
C75	.001	600	73801	P488-001	PTE6D1	GP2L-001	TM-21	Sync. Coupling
C76	.22	200	73560	P488-22	GT2P25		TC-2	1st Sync. Sep. Cath. Bypass
C77	.047	400	73553	P488-047	PTE4S5		TM-15	Sync. Coupling
C78	100	500	39628	1468-0001	5W5T1	GP1K-100	1FM-31	Sync. Coupling
C79	390	500	39642	1468-0004	5W5T4	GP2K-390	1FM-34	2nd Sync. Sep. Cath. Bypass
C80	.0022	600	73803	P488-0022	PTE6D2	GP2M-0022	TM-22	Integrator Net.
C81	.0047	600	73550	P488-0047	PTE6D5	GP2M-0047	TM-25	Integrator Net.
C82	.0047	600	73550	P488-0047	PTE6D5	GP2M-0047	TM-25	Integrator Net.
C83	.0047	600	73920	P488-0047	PTE6D5	GP2M-0047	TM-25	Vert. Osc. Grid Cap.
C84	.047	600	73592	P688-047	PTE6S5		TM-15	Vert. Discharge
C85	.1	400	73551	P488-1	PTE4P1		TM-1	Vert. Sweep Coupling
C86	.047	200	73558	P288-047	PTE4S5		TM-15	Isolation
C87	180	500	51416	1468-0002	5W5T2	GP2K-180	1FM-32	Hor. Sync. Coupling
C88	.0022	600	73803	P688-0022	PTE6D2	GP2M-0022	TM-22	Hor. Sync. Coupling
C89	.047	600	73592	P688-047	PTE6S5		TM-15	Hor. AFC Plate Bypass
C90	.22	400	73794	P488-22	GT4P25		TC-2	AFC Filter
C91	.022	400	73562	P488-022	PTE4S2		TM-12	AFC Filter
C92	180	1000	73102					Hor. Osc. Grid Cap.
C93	10000	500	73594	1467-01	1D3S1	GP2-335-01	1FM-11	Fixed Trimmer
C94	2200	500	73595			GP2M-0022		Hor. Discharge
C95	390	500	39642	1468-0004	5W5T4	GP2K-390	1FM-34	Hor. Sweep Coupling
C98	.047	1000	73564	P1068-047	GT16S5		TR-15	Hor. Output Screen Bypass
C97	.22	400	73794	P288-22	GT4P25		TC-2	Hor. Output Cath. Bypass
C98	.047	400	73553	P488-047	PTE4S5		TM-15	Bias Filter
C99	.033	1000	73596	P1068-033				Damper Filter
C100	.047	1000	73597	P1068-047	GT16S5		TR-15	Damper Filter
C101	5	1500	72809					Hor. Feedback
C102	500	20000	71450			410-500		HV Filter
C103	.01	400	73561	P488-01	PTE4S1	GP2-335-01	TM-11	Line Filter
C104	.01	400	73561	P488-01	PTE4S1	GP2-335-01	TM-11	Line Filter
C105	.47	200	73787	P288-47	GT2P5		TC-5	Hor. Sweep Coupling †
C106	1500		53494	GP1500M	1W5D15	GP2L-0015	1FM-215	AGC Filter

† Not used in all models.

CONTROLS

ITEM No.	RATING RESIST-ANCE	RATING WATTS	REPLACEMENT DATA RCA PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	72734	B11-137 *	970111-24	Vert. hold control, front
B	50KΩ	½		B11-123 *		Horiz. hold control, rear
C	Shaft End			E187 *		Attach per instructions in "Concentrikit".
R2A	50KΩ	½	74047	B11-123 *	970913-11	Brightness control, front
B	10KΩ	½		B17-116 *		Contrast control, rear
C	Shaft End			E187 *		Attach per instructions in "Concentrikit".
R3A	500KΩ	½	74048	B13-133 *	970913-10	Tone control, front
B	1 Meg.	½		B13-137X *		Volume control, rear tapped at 200KΩ
C	Shaft End			E187 *		Attach per instructions in "Concentrikit".
D	Switch			76-1 *		Attach per instructions in "Concentrikit".
R4	200KΩ	½	73579	Q11-130	M-52-S	AGC Threshold control
R5	2.5 Meg.	½	71440	Q11-239	M-84-S	Height control
R6A	5000Ω	4	74442		10-5000	Focus control, Wire Wound
B	2500Ω	4	72735		10-2500	Focus control, Wire Wound-See Note
R7	5000Ω	½	71441	Q11-114	M-19-S	Vert. linearity control

* Additional parts to be used with "Concentrikit".
NOTE - Used only on chassis KCS-32 and KCS-32A.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R8	100Ω	½		BTS-1000	RF Grid
R9	150Ω 20%	½			AGC Network
R10	150Ω 20%	½			RF Screen Decoupling
R11	2700Ω	½		BTS-2700	RF Plate
R12	100KΩ 20%	½		BTS-100K	Series Test Connection
R13	100KΩ 20%	½			Mixer Grid
R14	150Ω 20%	½			Mixer Decoupling
R15	1000Ω 20%	½		BTS-1000	Decoupling Network
R16	47Ω 20%	½			Osc. Cathode
R17	100KΩ 20%	½		BTS-100K	Osc. Grid
R18	100KΩ 20%	½		BTS-100K	Osc. Grid
R19	10KΩ 20%	½		BTS-10K	Osc. Plate
R20	150Ω 20%	½			Decoupling Network
R21	22KΩ 20%	½		BTS-22K	1st Video IF Transformer Shunt See Note 1
R22	39Ω	½			1st Video IF Cathode
R23	1000Ω 20%	½		BTS-1000	1st Video IF Decoupling
R24	150Ω 20%	½			Decoupling Network
R25	1000Ω 20%	½		BTS-1000	AGC Network
R26	18KΩ 5%	½		BTS-18K-5%	AGC Network
R27	5600Ω 5%	½		BTS-5600-5%	Voltage Divider
R28	10KΩ 5%	½			2nd Video IF Grid
R29	68Ω	½			2nd Video IF Cathode
R30	1000Ω 20%	½		BTS-1000	2nd Video IF Decoupling
R31	150Ω 20%	½			Decoupling Network

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA PART No.	IRC PART No.	IDENTIFICATION CODES
R32	[illegible]	½			3rd Video IF Cathode
R33	5600Ω 5%	½			3rd Video IF Plate
R34	1000Ω 20%	½		BTS-1000	3rd Video IF Decoupling
R35	150Ω 20%	½			Decoupling Network
R36	1000Ω 20%	½		BTS-1000	4th Video IF Screen Decoupling
R37	150Ω	½			4th Video IF Cathode
R38	6800Ω 5%	1			4th Video IF Plate
R39	1000Ω 20%	½		BTS-1000	4th Video IF Plate Decoupling
R40	5600Ω 5%	½		BTS-5600-5%	Video Det. Diode Load
R41	10Ω 20%	½		BW-½-10	Bias Network
R42	100Ω	½		BW-½-100	Video Amp. Cathode
R43	2200Ω	½		BTS-2200	Video Amp. Plate
R44	3300Ω 5%	½		BTS-3300-5%	Video Amp. Plate
R45	220KΩ	½		BTS-220K	Voltage Divider
R46	12KΩ	2		BT-2-12K	Video Amp. Cathode
R47	220Ω	½		BW-½-220	Voltage Divider
R48	5600Ω	1		BTA-5600	Video Amp. Plate
R49	8200Ω 5%	1		BTA-8200-5%	Video Amp. Plate
R50	2.2 Meg.	½		BTS-2.2 Meg.	Voltage Divider
R51	2.2 Meg.	½		BTS-2.2 Meg.	Picture Tube Grid
R52	82Ω	½			Sound IF Cathode
R53	1200Ω	½		BTS-1200	Sound IF Decoupling
R54	22KΩ	½		BTS-22K	Limiter Grid
R55	1000Ω 20%	½		BTS-1000	Limiter Plate Decoupling
R56	22KΩ 20%	½		BTS-22K	Limiter Screen
R57	47KΩ 20%	½		BTS-47K	Voltage Divider
R58	100KΩ 5%	½		BTS-100K-5%	Disc. Load
R59	100KΩ 5%	½		BTS-100K-5%	Disc. Load
R60	22KΩ 20%	½		BTS-22K	De-emphasis
R61	5.1Ω	½	72067	BW-½-4.7	Disc. Filament-Wire Wound
R62	82KΩ	½		BTS-82K	Tone Compensation
R63	10 Meg. 20%	½		BTS-10 Meg.	AF Grid
R64	330KΩ	½		BTS-330K	AF Plate
R65	470KΩ 20%	½		BTS-470K	Output Grid
R66	220Ω	1		BW-1-220	Output Cathode See Note 2
R67	270Ω	1		BW-1-270	Output Cathode
R68	1800Ω	2		BT-2-1800	Filter
R69	12KΩ	½		BTS-12K	Voltage Divider
R70	120KΩ	½		BTS-120K	AGC Network
R71	8200Ω 5%	½		BTS-8200-5%	Voltage Divider
R72	1.8 Meg. 5%	½		BTS-1.8 Meg. 5%	Voltage Divider
R73	470KΩ	½		BTS-470K	AGC Amp. Grid
R74	470KΩ	½		BTS-470K	Voltage Divider See Note 3
R75	100KΩ	½		BTS-100K	AGC Rect. Cathode
R76	2700Ω	½		BTS-2700	Voltage Divider
R77	4700Ω	½		BTS-4700	AGC Rect. Plate
R78	5600Ω	½		BTS-5600	Isolation
R79	150KΩ	½		BTS-150K	1st Sync. Sep. Grid
R80	330KΩ	½		BTS-330K	1st Sync. Sep. Cathode
R81	5600Ω	½		BTS-5600	1st Sync. Sep. Cathode
R82	27KΩ	½		BTS-27K	1st Sync. Sep. Plate
R83	47KΩ	½		BTS-47K	Isolation
R84	10 Meg.	½		BTS-10 Meg.	Voltage Divider
R85	1 Meg.	½		BTS-1 Meg.	Sync. Amp. Grid
R86	15KΩ	1		BTA-15K	Sync. Amp. Plate
R87	3.9 Meg.	½		BTS-3.9 Meg.	2nd Sync. Sep. Grid
R88	6800Ω	½		BTS-6800	2nd Sync. Sep. Cathode
R89	22KΩ	½		BTS-22K	Integrator
R90	8200Ω	½		BTS-8200	Integrator
R91	8200Ω	½		BTS-8200	Integrator
R92	1.5 Meg. 5%	½		BTS-1.5 Meg. 5%	Vert. Osc. Grid
R93	220KΩ	½		BTS-220K	Vert. Osc. Plate
R94	2.2 Meg.	½		BTS-2.2 Meg.	Voltage Divider
R95	100KΩ	½		BTS-100K	Voltage Divider
R96	8200Ω 5%	½		BTS-8200-5%	Vert. Peaking
R97	2.2 Meg.	½		BTS-2.2 Meg.	Vert. Output Grid
R98	2700Ω	½		BTS-2700	Vert. Output Cathode
R99	1000Ω 20%	½		BTS-1000	Vert. Output Plate Decoupling
R100	56KΩ	½		BTS-56K	Filter
R101	820KΩ 5%	½		BTS-820K-5%	Horiz. AFC Grid
R102	150KΩ	½		BTS-150K	Horiz. AFC Cathode
R103	150KΩ 5%	1		BTA-150K-5%	Horiz. AFC Cathode
R104	8200Ω	½		BTS-8200	Horiz. AFC Filter Network
R105	2.7 Meg. 5%	1		BTA-2.7Meg. 5%	Voltage Divider
R106	68KΩ	½		BTS-68K	Voltage Divider
R107	120KΩ	1		BTA-120K	Voltage Divider
R108	100KΩ 5%	1		BTA-100K-5%	Horiz. Osc. Grid
R109	8200Ω 5%	½		BTS-8200-5%	Horiz. Osc. Transformer Shunt
R110	22KΩ	½		BTS-22K	Horiz. Osc. Transformer Shunt
R111	120KΩ	1		BTA-120K	Horiz. Osc. Plate
R112	150KΩ	½		BTS-150K	Horiz. AFC Filter Network
R113	47Ω 20%	½			Parasitic Supp.
R114	820KΩ	½		BTS-820K	Horiz. Output Grid
R115	180KΩ	½		BTS-180K	Horiz. Output Grid
R116	39Ω	1		BW-1-39	Horiz. Output Cathode
R117	47Ω	1		BW-1-47	Bias Network
R118	10KΩ	2		BT-2-10K	Horiz. Output Screen See Note 4
R119	10KΩ	½		BTS-10K	Filter
R120	3.3Ω	½	71513		HV Rect. Filament
R121	1 Meg. 20%	1			HV Filter
R122	560KΩ	½		BTS-560K	Feedback
R123	500Ω	20	74049	DG-500	Bias Network-Wire Wound
R124	10Ω	½			Filter Network See Note 5
R125	390Ω	2	72325	BW-2-390	Focus Coil Shunt-Wire Wound See Note 6
R126A	850Ω	12	73588	DG-850	Filter-Wire Wound
B	650Ω	6			Voltage Divider-Wire Wound
C	650Ω	6			Bias Network-Wire Wound
R127	1800Ω	2		BT-2-1800	Voltage Divider
R128	6800Ω	2		BT-2-6800	Bleeder
R129	6800Ω	2		BT-2-6800	Bleeder

Note 1. Some models use 10KΩ resistor in this application.
Note 2. Used only on chassis KCS32B and KCS23C.
Note 3. Some models use 560KΩ resistor in this application.
Note 4. Some models use 6800Ω resistor in this application.
Note 5. Not used in all models.
Note 6. Some models use 330Ω resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA RCA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC at 2.05A	750VCT .250ADC	5VAC at 3A	5VAC at 2A	74046	P-8153 ②		TP-355
		SEC. 4 6.3VAC at 7.4A	SEC. 5 6.3VAC at 1.6A					

② Redrill mounting holes.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA RCA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	1250 Tap at 90Ω	36Ω	73576				Hor. Osc. Trans.
T3	165Ω	1310Ω	73569	A-8121 ①	A-4000 ①	TBO-2	Vert. Block Osc. Trans.
T4	33kΩ Tap at 173Ω	SEC. 1 10.8Ω Tap at .6Ω SEC. 2 0Ω	73570	A-8117		TFB-1	Hor. Output Trans.
T5	521Ω	6.9Ω	73568	A-8116	A-3035	TSO-4	Vert. Output Trans.
T6A	13.5Ω		71420	DY-1			Hor. Deflection Coil
B	64.6Ω						Vert. Deflection Coil
T7	364Ω		73566				Focus Coil

① Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA RCA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T8	5.8kΩ	4.2Ω	500Ω	.26Ω	71419	A-3877	A-2930	RO-9 ①	①Drill one new mounting hole

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA RCA PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1A	PM	4.2Ω	73993		57A15	
B	PM		73635			
	CONE DIA.	V. C. DIA.				
SP2A	4 3/4" x 7"	3/4"				
B	12"		73994			

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA RCA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.250A	43Ω	1.3 Henries	73154	C-2325 ①	C-2991	TR-3300 ①	①Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA RCA PART No.	MEISSNER PART No.	NOTES
L2	Ant. Input Trans.	.5Ω	.2Ω	73578		Includes mounting bracket and socket.
L3	IF Trap	.5Ω		73476		Includes 12MMF capacitor.
L4	IF Trap Shunt	.5Ω		73475		
L5	IF Trap	.5Ω		73476		Includes 12MMF capacitor.
L6	RF Grid	0Ω		73633		Complete with stator, rotor, coils and segments.
L7A	RF Plate Trimmer	0Ω		73446		Channel #13. Smooth bushing type with screw adjustments.
B	RF Plate Trimmer	0Ω		74110		Channel #13. Threaded bushing type with screw adjustments.
L8	RF Plate	0Ω		73471		Includes stator, rotor, coils and segments.
L9	RF Plate	0Ω		73460		Channel 6
L10	RF Coupling	0Ω		73462		
L11A	Mixer Grid Trimmer	0Ω		74109		Channel #13. Threaded bushing type with screw adjustment.
B	Mixer Grid Trimmer	0Ω		73444		Channel #13. Smooth bushing type with screw adjustment.
L12	Mixer Grid	0Ω		73470		Includes stator, rotor, coils and segments.
L13	Mixer Grid	0Ω		73874		Channel 6
L14A	Osc. Plate Trimmer	0Ω		73444		Channel #13. Smooth bushing type with screw adjustment.
B	Osc. Plate Trimmer	0Ω		74109		Channel #13. Threaded bushing type with screw adjustment.
L15	Osc. Plate	0Ω		73468		Includes stator, rotor, coils and segments.
L16	Osc. Plate	0Ω		73469		Includes stator, rotor, coils and segments.
L17	Osc. Plate	0Ω		73874		Channel #6
L18A	Osc. Plate Trimmer	0Ω		74108		Channel #13. Threaded bushing type with plunger adjustment.
B	Osc. Plate Trimmer	0Ω		73443		Channel #13. Smooth bushing type with plunger adjustment.
L19	Fil. Choke	0Ω		73477		
L20	Fil. Choke	0Ω		73477		
L21	Fil. Choke	0Ω		73477		
L22	Conv. Trans.	.5Ω	0Ω	73448		
L23	1st Video IF	.1Ω	0Ω	73571		Includes C29 and R21
L24	Fil. Choke	0Ω		73477		
L25	2nd Video IF	.1Ω		73572		Includes C30
L26	3rd Video IF & Sound Take Off	.1Ω		73573		Includes C38

TV **PARTS LIST AND DESCRIPTIONS (Continued)**

COILS (RF-IF) CONT.

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA RCA PART No.	REPLACEMENT DATA MEISSNER PART No.	NOTES
L27	Peaking	2.3Ω		74170		36 microhenries. Wound on 8.2KΩ resistor.
L28	4th Video IF	.1Ω	0Ω	73574		Includes 36MMF capacitor.
L29	Sound Trap	0Ω		71778		Includes C41
L30	5th Video IF	.1Ω	0Ω	73575		Includes 56MMF and 8.2MMF capacitor.
L31	Peaking	4.1Ω		72619		93 microhenries. Wound on 10KΩ resistor . Orange identification dot.
L32	Peaking	6Ω		71528		180 microhenries. Wound on 39KΩ resistor. White identification dot.
L33	4.5MC Trap	2.5Ω		73577		Includes C51
L34	Peaking	7.2Ω		71526		250 microhenries. Green identification dot.
L35	Peaking	6Ω		71528		180 microhenries. Wound on 39KΩ resistor. White identification dot.
L36	Peaking	6.2Ω		71526		250 microhenries. Green identification dot.
L37	Sound IF	0Ω	0Ω	71424		
L38	Disc. Trans.	0Ω	0Ω	71427		
L39	Width Cont.	.2Ω		71429		
L40	Hor. Linearity	34Ω		71449		

MISCELLANEOUS

ITEM No.	PART NAME	RCA PART No.	NOTES
M1	RF Tuner	KRK5	
M2	Fuse	73600	Type GJV .25A
M3	Ion Trap	73301	Permanent magnet type
	Cabinet Back	74058	Model 8TK29
	Cabinet Back	74053	Model 8TR29
	Safety Glass	73863	
	Knob	73224	Channel selector — Walnut and mahogany models.
	Knob	73222	Fine tuning — Walnut and mahogany models.
	Knob	73226	Tone, Vert. hold, Brightness — Walnut and mahogany models.
	Knob	73228	Volume, Contrast, Hor. hold — Walnut and mahogany models.
	Knob	73225	Channel selector — Toasted mahogany models.
	Knob	73223	Fine tuning — Toasted mahogany models.
	Knob	73227	Tone, Brightness, Vert. hold — Toasted mahogany models.
	Knob	73229	Volume, contrast, Hor. hold — Toasted mahogany models.
	Escutcheon	73642	Channel marker (Walnut or mahogany models)
	Escutcheon	73740	Channel marker (Toasted mahogany models.)
	Trimmer Strip	73580	Hor. locking range (10-160MMF), Hor. drive cont. (40-370MMF)

RADIO **PARTS LIST AND DESCRIPTIONS**

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA RCA PART No.	REPLACEMENT DATA STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V25	Converter	6J6	6J6	7BF	
V26	1st IF Amp.	6BA6	6BA6	7BK	
V27	FM 2nd IF Amp.	6AU6	6AU6	7BK	
V28	Ratio Det.	6AL5	6AL5	6BT	
V29	DET.-AVC	6AV6	6AV6	7BT	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RCA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C107	2	50	73747	PRS150/4	BBR2-50T		TVA-12	Stabilizing Cap.
C108	1500		73748	GP1500M	1W5D15	GP2L-0015	1FM-215	RF Coupling
C109	100		39396	CN100KN750	5R5T1	N750L-100	MS-31	Fixed Trimmer
C110	68		33103	GP68M		GP1K-68		Osc. Feedback
C111	15		31353	GP15M		GP1K-15		Osc. Grid Cap.
C112	56		73867					Fixed Trimmer
C113	2		73866					Fixed Trimmer
C114	150		48125	GP150M	5W5T15	GP2K-150	1FM-315	Osc. Grid Cap.
C115	.01	400	71925	P488-01	PTE4S1	GP2-335-01	TM-11	Osc. Plate Decoupling
C116	47		39042	GP47M	5W5Q5	GP1K-47	1FM-45	Conv. Filament Bypass
C117	.005	400	71553	P688-005	PTE6D5	GP2M-005	TM-25	Conv. Plate Dec.
C118	100		39396	CN100JN750	5R5T1	N750L-100	MS-31	Fixed Trimmer
C119	.05	200	54859	P288-05	PTE4S5		TM-15	AVC Filter
C120	5000		73473	BPD-5	1D5D5	811-005	29C1	AVC Filter
C121A	4000		74009	GP4000M	1D5D4	811-005	36C2	1st IF Screen Bypass
B	4000			GP4000M	1D5D4	811-005		1st IF Decoupling
C122	5000		73473	BPD-5	1D5D5	811-005	29C1	1st IF Fil. Bypass
C123A	200		*	GP200M	5W5T2	GP2K-200	1FM-32	Diode RF Filter
B	200			GP200M	5W5T2	GP2K-200	1FM-32	Diode RF Filter
C124A	4000		74009	GP4000M	1D5D4	811-005	36C2	2nd IF Screen Bypass
B	4000			GP4000M	1D5D4	811-005		2nd IF Decoupling
C125	.005	400	71553	P688-005	PTE6D5	GP2M-005	TM-25	2nd IF Cath. Bypass
C126	330	500	39640	1468-0003	5W5T3	GP2K-330	1FM-335	Diode Load Cap. †
C127	330	500	39640	1468-0003	5W5T3	GP2K-330	1FM-335	Diode Load Cap. †
C128	.005	400	71553	P688-005	PTE6D5	GP2M-005	TM-25	De-emphasis
C129A	4000		74009	GP4000M	1D5D4	811-005	36C2	DAVC Decoupling
B	4000			GP4000M	1D5D4	811-005		DAVC Decoupling

* Items C123A, C123B and R143 are combined into one unit, obtainable under MFGR'S part No. 74011.
† When either item C126 or C127 are replaced, replace both with capacitors of equal value.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	RCA PART No.	IRC PART No.	
R130	10Ω	½			Parasitic Supp.
R131	3.9 Meg.	½		BTS-3.9 Meg.	Conv. Grid
R132	27KΩ	½		BTS-27K	Conv. Plate Decoupling
R133	18KΩ	½		BTS-18K	Osc. Grid
R134	100Ω	½			Parasitic Supp.
R135	15KΩ	½		BTS-15K	Osc. Plate Decoupling
R136	68Ω	½			1st IF Cathode
R137	27KΩ	½		BTS-27K	1st IF Screen
R138	680Ω	½		BTS-680	Decoupling
R139	22 Meg.	½		BTS-22 Meg.	Delayed AVC
R140	150KΩ	½		BTS-150K	Diode Load
R141	150KΩ	½		BTS-150K	AVC Network
R142	2.2 Meg.	½		BTS-2.2 Meg.	AVC Network
R143	47KΩ	½		BTS-47K	Diode Filter See Note 7
R144	120Ω	½			2nd FM IF Cathode
R145	15KΩ	½		BTS-15K	2nd FM IF Screen
R146	680Ω	½		BTS-680	2nd FM IF Decoupling
R147	100Ω	½			Balancing
R148	15KΩ	½		BTS-15K	De-emphasis
R149	3300Ω 5%	½		BTS-3300-5%	Ratio Det. Diode Load
R150	1200Ω	½		BTS-1200	Balancing
R151	39KΩ 5%	½		BTS-39K-5%	Ratio Det. Diode Load
R152	470KΩ	½		BTS-470K	AVC Network
R153	10KΩ	½		BTS-10K	De-emphasis
R154	.5Ω	1			Filament Dropping-Wire Wound
R155	.5Ω	1			Filament Dropping-Wire Wound

Note 7. Items C123A, C123B and R143 are combined into one unit, obtainable under MFGR'S part No. 74011.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	RCA PART No.	MEISSNER PART No.	
L41	FM Ant.	0Ω		74024		No. 16 buss tinned, 8 turns per inch, 2 1/2 turns L. H.
L42	AM Ant.	24Ω	2Ω	74020		
L43	FM Osc.	0Ω		74025		No. 16 buss tinned, 9 turns per inch, 4 7/8 turns L. H.
L44	AM Osc.	1Ω	6.5Ω	73744		Pick-up coil 2Ω
L45	1st IF FM	.3Ω	.3Ω	73745		
	AM	8Ω	8Ω			
L46	2nd IF FM	.8Ω	.8Ω	74019		
	AM	7Ω	7Ω			
L47	Ratio Det. Trans.	.9Ω	.3Ω	73743		

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					RCA PART No.		
M4	Bayonet	7.5	.2	White	11765		Type #51
M5	Bayonet	7.5	.2	White	11765		Type #51
M6	Bayonet	7.5	.2	White	11765		Type #51 (Jewel lamp used in model 8TK29 only.)

MISCELLANEOUS

ITEM No.	PART NAME	RCA PART No.	NOTES
M7A	Function Switch	74260	Used with RK135A tuner. Complete with heater SW and shorting SW.
B	Function Switch	74018	Used with RK135 tuner. Complete with heater SW and shorting SW.
M8	Heater Switch	74031	
M9	Shorting Switch	74032	
M10	Tuning Cap.	74017	(20-392MMF) (17-197MMF) (W/T)
	Knob	74056	Radio tuning, selector switch (Walnut and mahogany models)
	Knob	74057	Radio tuning, selector switch (Toasted mahogany models)
	Bezel	74052	Lucite bezel and dial scale assembly

DISASSEMBLY INSTRUCTIONS-MODEL 8TR29

1. Remove six push-on type control knobs.
2. Remove five screws holding rear cover. Remove cover.
3. Loosen two screws holding antenna terminal strip. Free strip.
4. Loosen two screws holding audio plug. Free plug.
5. Remove two screws holding top panel. Remove panel.
6. Remove two screws on bottom holding front of cabinet.
7. Loosen two wing nuts on back of front panel. Remove front panel. Remove two panel lamp assemblies from front panel.
8. Remove picture tube base socket, HV cap, and beam bender.
9. Loosen picture tube front mounting clamps. Remove picture tube.
10. Remove speaker plug.
11. Free antenna leads from clamp.
12. Remove six 3/8" hex head bolts holding chassis in cabinet. Remove chassis.
13. Remove four 11/32" hex nuts holding speaker. Remove speaker.

CRITICAL LEAD DRESS (TV CHASSIS)

1. The ground bus from pin 2 and the center shield of V11 socket should not be shortened or rerouted.
2. Do not change the dress of the filament leads or the by-pass capacitors in the picture or sound IF circuits. The filament leads between V11, V12, V13 should be down against the chassis and away from grid or plate leads.
3. If it is necessary to replace any of the 1500MMF capacitors in the picture IF circuit, the lead length must be kept as short as possible.
4. Picture IF coupling capacitors C28, C33, C37 and C45 should be up and away from the chassis and should be clear of the pix IF transformer adjustments by at least 1/4 inch. If the dress of any of these capacitors is changed, the IF alignment should be rechecked.
5. Leads to L32 and L31 must be as short as possible.
6. Dress peaking coils L35, L34 and L36 up and away from the chassis.
7. Dress C61 across tube pins 5 and 6 with leads not exceeding 3/8 inch.
8. Dress the blue lead from pin 5 of V13 down against the chassis.
9. Dress C52 and C53 up and away from the chassis.
10. Dress the yellow lead from the picture control away from the chassis. Dress the yellow lead from pin 8 of V9 of V9 away from the chassis.
11. Dress the green lead from pin 2 of V9 away from the chassis.
12. Dress R102, R101, R105, R108 and R103 up and away from the chassis.
13. The leads to the volume control should be dressed down against the chassis and away from V11 and V12.
14. Contact between the RF oscillator frequency adjustment screws and the oscillator coils or channel switch eyelets must be avoided.
15. Dress leads from L39 (width control coil) away from the transformer frame.

CRITICAL LEAD DRESS (AM-FM CHASSIS)

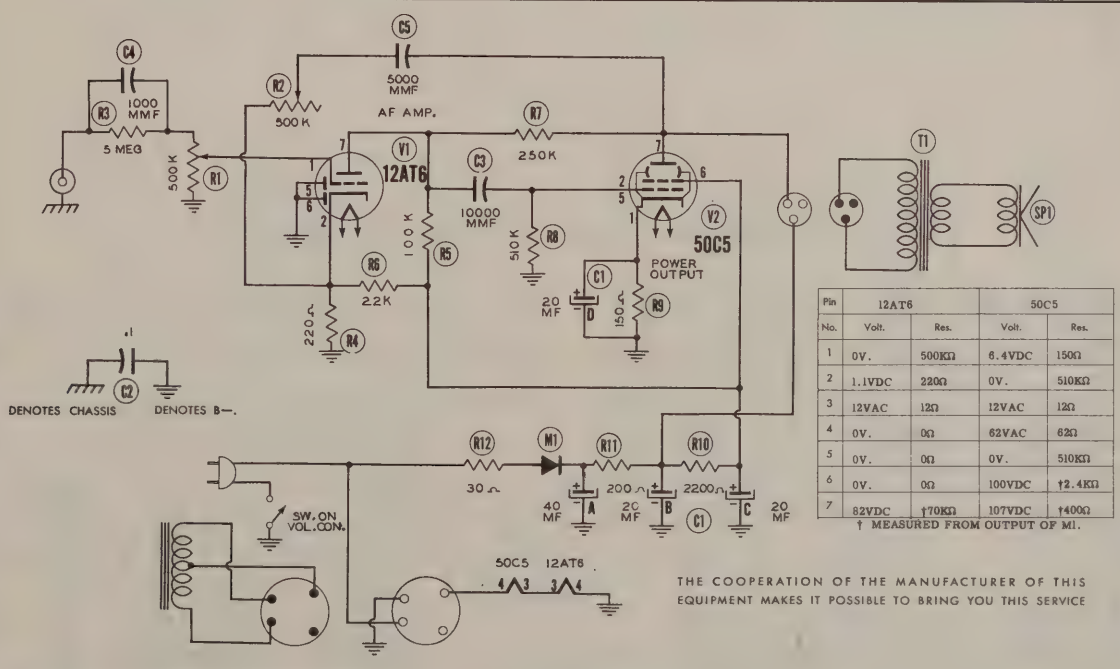
1. Ground lead on pin 2 of V26 and V27 should be dressed down flat on chassis.
2. Dual .005MFD capacitors and diode filter should be dressed to clear the bottom of the cabinet.
3. Dress C122 across V26 sockets with short and direct leads.
4. Dress V26 plate lead from pin 5 down to the chassis.
5. Dress AVC lead from R152 to switch down to chassis and against back of gang mounting plate.
6. Dress lead from pin 6 of V29 down to chassis and against back of gang mounting plate.
7. Dress AVC lead from 1st IF to switch against chassis and against gang mounting plate.
8. Dress lead from switch to pin 1 of V25 against plate supporting gang.
9. Dress all insulated FM leads down to chassis.
10. Connect C108 with short lead to pin 6 of V25 keeping body of cap away from plate lead and switch terminals.
11. The coupling between L41 and L43 should be adjusted to give proper injection voltage to the mixer grid. This has been found to be correct when the distance between adjacent end turns is 3/8" to 7/16" measured at top of the form.
12. Dress cabled leads away from antenna transmission lines.
13. Dress all uninsulated bus wire so as to avoid short circuits.

SILVERTONE
MODEL 9161 (Ch. 548.358)

SILVERTONE
MODEL 9161 (Ch. 548.358)

SILVERTONE MODEL 9161

TRADE NAME	Silvertone, Model 9161 (Ch. 548.358)
SUPPLIER	Sears, Roebuck and Co., 925 S. Homan St., Chicago, Illinois
TYPE SET	AC Operated 3 Speed Phono Player with 2 Tube Amplifier
TUBES (TWO)	Types 12AT6 AF Amp., 50C5 Power Output
POWER SUPPLY	110-120 Volts AC
RATING	.38 Amp. at 117 Volts AC



Pin No.	12AT6 Volt.	12AT6 Res.	50C5 Volt.	50C5 Res.
1	0V.	500KΩ	6.4VDC	150Ω
2	1.1VDC	220Ω	0V.	510KΩ
3	12VAC	12Ω	12VAC	12Ω
4	0V.	0Ω	62VAC	62Ω
5	0V.	0Ω	0V.	510KΩ
6	0V.	0Ω	100VDC	†2.4KΩ
7	82VDC	†70KΩ	107VDC	†400Ω

† MEASURED FROM OUTPUT OF M1.

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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88-10

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

HOWARD W. SAMS & CO., INC. • Indianapolis 1, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	AF Amp.	12AT6	12AT6	7BT	
V2	Power Output	50C5	50C5	7CV	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	150	1621	PRSA844D ‡	EDL33215C			Filter-Red
B	20	150		PRS25/25	‡			Filter-Yellow
C	20	150						Filter-Yellow
D	20	25						Output Cath. Bypass -Blue
C2	.1	200	1622	P288-1	PTE4P1		TM-1	Line Isolation
C3	10000		*	GP10000M	PTE4S1	821-01	TM-11	Audio Coupling
C4	1000			GP1000M	1W5D1	GP2L-001	1FM-21	Tone Compensation
C5	5000		1620	GP5000M	1D5D5	811-005	1FM-25	Tone Compensation

* Items C3 and R5 are combined into one unit, obtainable under MFGRS' Part No. 1623. ‡ Use ring mounting

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Silvertone PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES	
R1A	500KΩ	½	1631	Q13-133	15/16-60-Z	Volume control	* Attach to R1A per instructions
B	Switch		Not Req.	76-1 *	SPST Switch#		# Attached at factory.
R2	500KΩ	½	1632	Q13-133	15/16-60-Z	Tone control	

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	IDENTIFICATION CODES
R3	5 Meg.	½		BTS-4.7 Meg.	Tone Compensation See Note 1 and 3
R4	220Ω	½	1625	BW-½-220	AF Cathode
R5	100KΩ	½		BTS-100K	AF Plate See Note 2
R6	22KΩ	½	1626	BTS-22K	Voltage Divider
R7	250KΩ	½		BTS-270K	Feedback
R8	510KΩ	½	1624	BTS-470K	Output Grid
R9	150Ω	½	1627	BW-½-150	Output Cathode
R10	2200Ω	½	1628	BTS-2200	Filter
R11	200Ω	1	1629	BW-1-220	Filter
R12	30Ω	½	1630		Surge Limiter

Note 1. Items C4 and R3 are combined into one unit.
Note 2. Items C3 and R5 are combined into one unit, obtainable under MFGR'S part No. 1623.
Note 3. Some models use 510KΩ resistor in place of C4 and R3 in this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	2.4KΩ	3.3Ω	210Ω	.6Ω	Part of 1639	A-3876 §	A-2928 §	RO-2 §	§ Bend mounting tabs down and mount on original bracket.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: SILVERTONE PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.		ST-105 #		
SP1	PM	3.3Ω	1639	MOD. P5-X	5A1 #	# Remount output transformer.
	CONE DIA.	V. C. DIA.				
SP2	4 7/8"	9/16"				

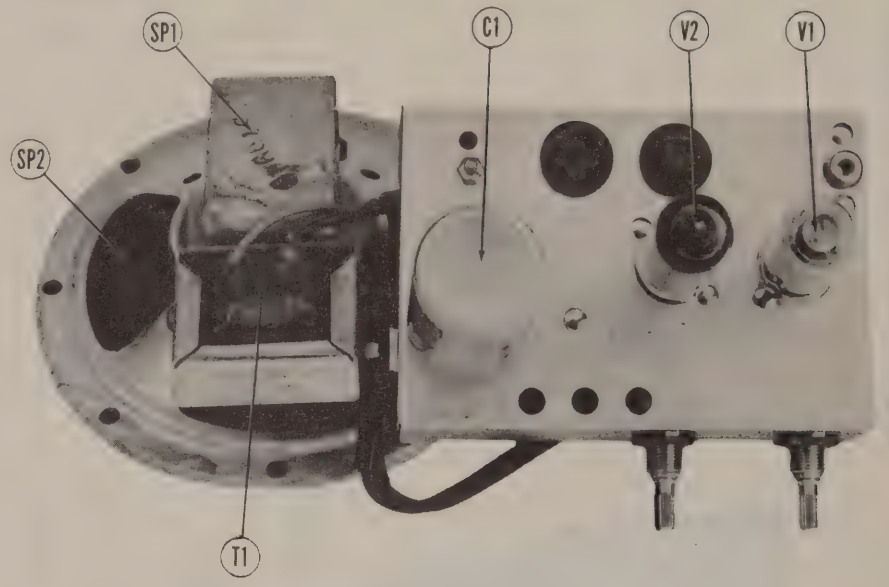
SELENIUM RECTIFIER

ITEM No.	RATING: CURRENT	REPLACEMENT DATA: SILVERTONE PART No.	SYLVANIA PART No.		NOTES
M1	.045A	1633	NB-5		

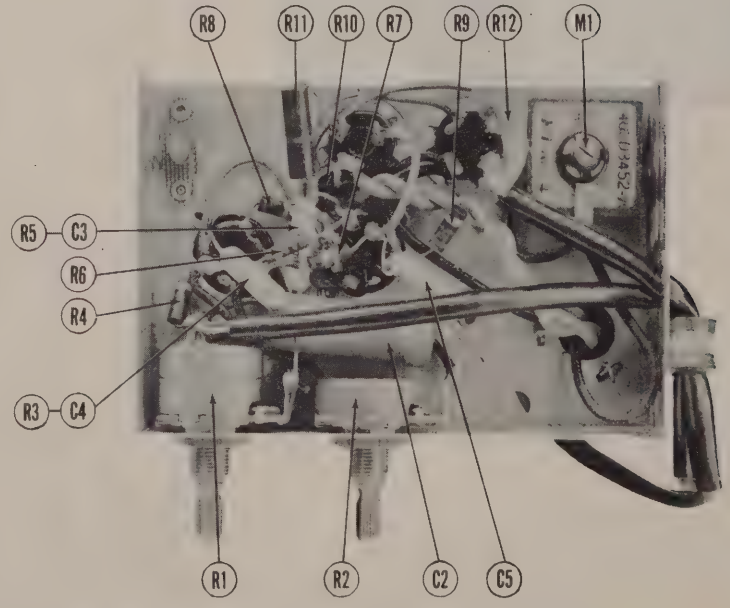
PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA: Silvertone PART No.	ASTATIC PART No.	SHURE PART No.	REMARKS
M2	1638	ACD-J	W22AB	

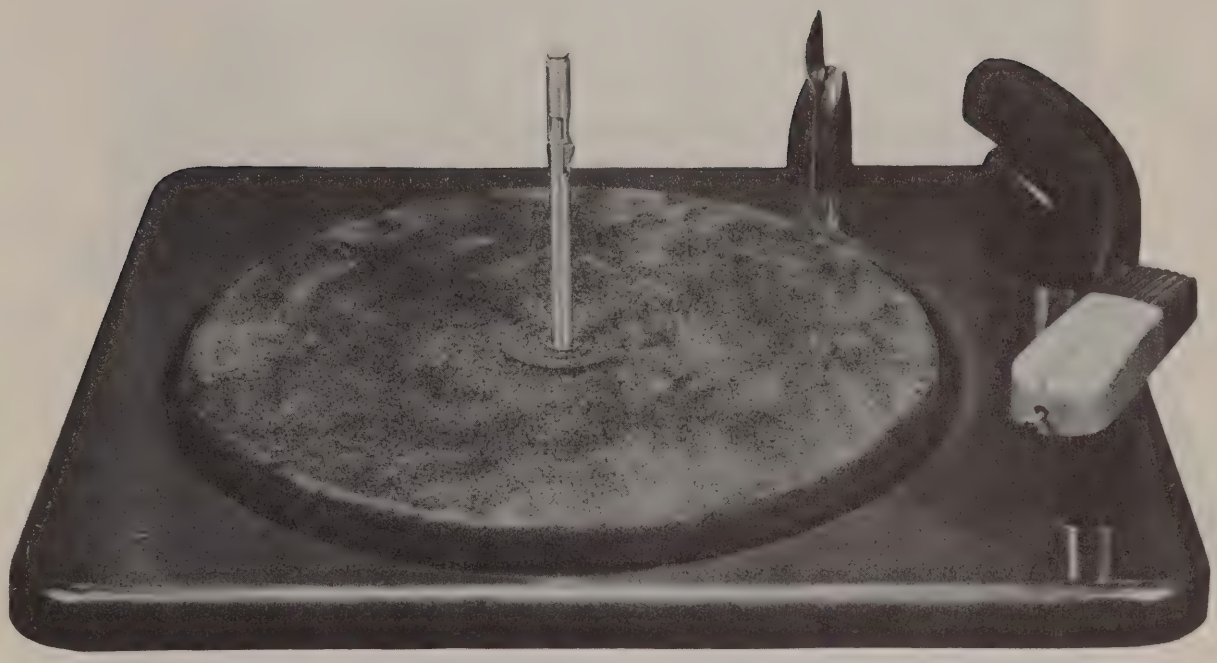
CHASSIS—TOP VIEW



CHASSIS—BOTTOM VIEW



SILVERTONE
MODELS 101.762 • 101.763



TOP VIEW

SILVERTONE
MODELS 101.762 • 101.763

GENERAL INFORMATION

The 101.762 and 101.763 record changers are designed to play automatically up to twelve 10-inch, ten 12-inch, or ten records intermixed in any order. On completion of the last record, the pickup arm will return to a rest position on the reject button and the mechanism will automatically shut off. Any record may be rejected while playing by pressing on the reject button.

These changers have been designed to operate on 110 volts, 60 cycles AC, unless otherwise indicated. Both changers, the 101.762 and 101.763, are similar; however, 101.763 has a Bottom Pan Assembly and a longer pickup lead.

Manufactured by: SEARS ROEBUCK & CO., 925 S. HOMAN ST., CHICAGO, ILLINOIS
Parts should be ordered from the nearest Sears retail store or mail order branch

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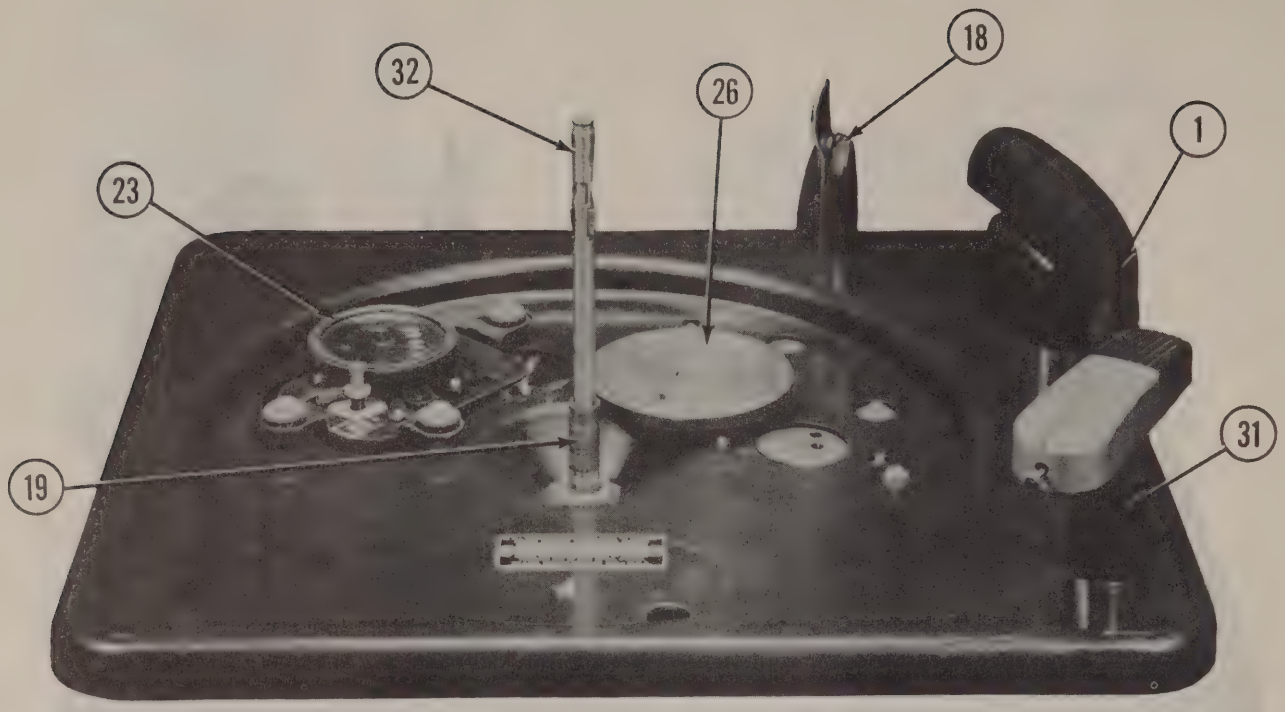


TOP VIEW—LESS TURNTABLE

MANUAL OPERATION

All odd-size records, or home recordings, should be played manually. To play records manually, the following procedure is necessary:

1. Place the record to be played on the spindle, allowing it to rest on the spindle fingers (C).

2. Press down on the head of the pickup arm, which is resting on the reject button (27). The mechanism is now turned on, the record will drop on to the turntable, and the pickup arm will come into its proper playing position.

3. As in home recordings, which have no lead-in groove, or records that are smaller than a standard record, it will be necessary to place the needle in the first groove of the record.

4. On completion of standard records, the mechanism will be tripped, returning the pickup arm to its rest position on the reject button, and the mechanism will automatically shut off. In connection with records, such as home recordings, that do not have lead-in grooves, the mechanism will have to be tripped by pressing down on the reject button (27).

5. Remove the record by lifting straight up.

LOADING AND AUTOMATIC OPERATION

1. Place a stack of records on the spindle, allowing them to rest on the spindle fingers (C).

2. Press down on the head of the pickup arm which is in a rest position on the reject button (27). The changer will now play the entire stack of records and will automatically shut off on completion of the last record.

3. A record may be rejected at any time while playing by pressing on the reject button.

4. To turn off the changer, remove any records remaining on the spindle fingers. Press down on the reject button. The pickup arm will return to its rest position on the reject button and the changer will shut off automatically.

CHANGE CYCLE

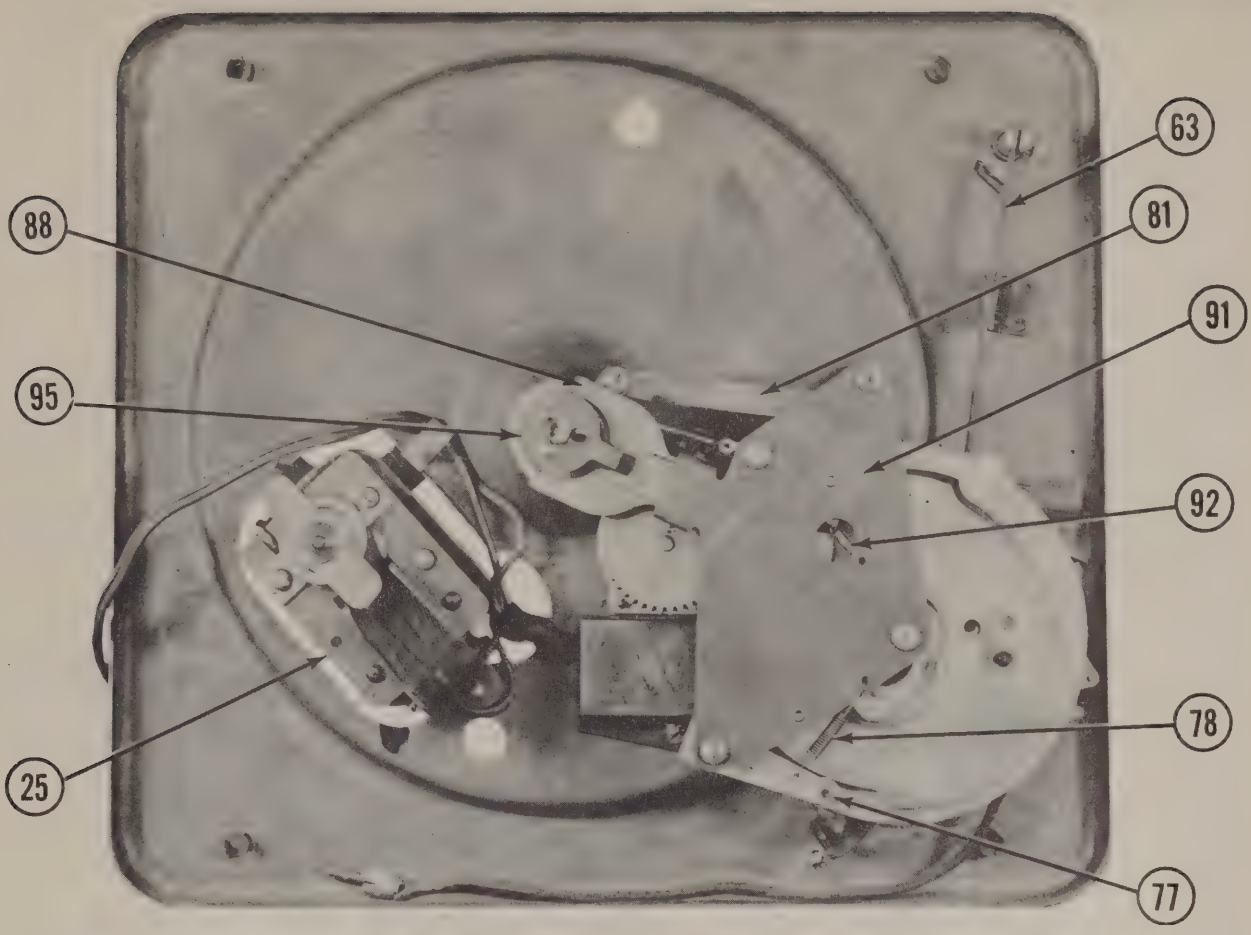
As the pickup arm oscillates in the eccentric groove of the record, it causes the serrated end of the ratchet lever (50), which is fastened to the pickup arm outer sleeve assembly (17), to actuate the pawl of the trip lever (61). As a result, the trip lever is moved against the hinge lever bracket (60), thus tripping the hammer lever (70). The hammer lever now pivots against the top of the locking button (74) pushing it down. This releases the pivot lever assembly (68) bringing the cycle idler wheel (26) into a positive frictional position with the hub of the turntable, starting the change cycle.

The pinion (71) rotating with the cycle idler wheel (26) drives the cam assembly (75) through the change cycle. As the cam assembly rotates, the locking button (74) returns to a raised position by the retaining spring (79).

The arm-operating shaft (65) rides up the incline portion on the outer edge of the cam assembly (75). The arm-operating lever (64), which is fastened to the shaft, contacts the sleeve assembly (57) and pushes it upward; as a result, the pickup arm is raised from the record. A positive frictional condition is set up when the operating lever contacts the rubber surface of the sleeve assembly. The positioning lever (13), which is fastened to the other end of the operating lever (64), directs the movement of the outer sleeve assembly (17) and, in turn, the pickup arm; therefore, as the pin of the operating lever follows the track of the cam assembly, the pickup arm is moved outward coming to a rest on the reject button clearing the records. At this point, a flange on the outside edge of the cam assembly contacts and pushes up on the finger of the discriminator lever (55), resetting it with the trip lever (part of 18), which is part of the positioning mechanism.

As the pickup arm is moving outward, the flange (A) of the cam assembly (75) moves under the hammer lever (70), resetting the hammer lever and hinge lever bracket (60).

The pin of the finger-operating lever (81), riding in the groove on the bottom of the cam, now actuates the finger-operating lever, which, in turn, operates the record-selecting mechanism. The cage plate (83) and the spindle cage (94), which turn as one unit, push the fixed spindle lever (95) down. This action causes the fixed spindle lever to pull down on the



BOTTOM VIEW

spindle cap assembly (32A), causing the record holding fingers to be pushed outward. This grips the second record above the record support fingers (32C), thereby allowing just the bottom record to drop. The lever of the hub and lever assembly (86), which extends through the slot of the spindle cage plate (83), is now turned by the cage plate. The hub and lever assembly is fastened to an inner sleeve of the spindle; therefore, as the hub and lever assembly turns, the record support fingers are retracted allowing the bottom record to drop to the turntable.

The arm-operating lever (64) now moves the pickup arm in for positioning, and the finger-operating lever (81) returns the selecting mechanism to its original position.

For 10-inch positioning, the finger of the discriminator lever (55) will be resting on the step of the trip lever which pivots in the post assembly (18). This allows the positioning lever (51) to move in over the step at the other end of the discriminator lever (55). The positioning lever now pushes against the short stud on top of the arm-operating lever (64), causing the long stud following the cam to push against the pin guide lever (101) so as to follow the inner track; thus, the pickup arm is positioned for 10-inch set down.

As a 12-inch record drops, the record strikes the trip lever which is pivoted in the post assembly (18). This causes the discriminator lever to contact the end of the step on the trip lever, thereby setting the discriminator lever so the positioning lever (51) will contact the edge of the step on the end of the discriminator lever. As a result, the positioning lever is held away from the pin of the arm-operating lever allowing the stud of the lever following the cam to follow the outer track; thus the pickup arm is positioned for 12-inch set down.

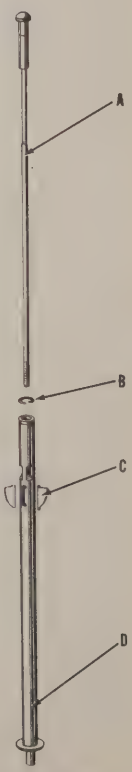
The arm-operating shaft (65) now rides down the incline portion of the cam, lowering the pickup arm to the record. The arm-operating lever (64), lowered with the shaft, is moved away from the middle sleeve assembly (57), thereby giving free movement to the pickup arm.

The cam stop lever (77), riding around the cam face on the bottom edge of the gear, snaps the cam assembly into a locked position as the locking button (74) moves against the stop bracket (69) of the pivot lever (68). This action moves the pivot lever away from the centerpost, causing the cycle idler wheel (26) to be moved away from the turntable hub. This completes the change cycle.

SHUT-OFF MECHANISM

The spring which is riveted on the end of the shut-off lever, and which has a 90° bend on the end, is responsible for holding the shut-off trip pawl (102) in an outward position when pressure is applied to the spindle. When the last record has dropped from the spindle, pressure is released from the spindle assembly, thus disengaging the pawl from the spring on the shut-off lever assembly .

When the mechanism is tripped, the change cycle is set in motion. The cam assembly will be turned a half turn, moving the pickup arm out over the reject button. The shut-off button (73) comes in contact with the shut-off trip pawl (102) causing the button to be raised. The pickup arm is now lowered to the reject button; the shut-off button moves against the switch shut-off lever (58) and the stop bracket (69) of the pivot lever assembly (68). The cam is now snapped into position by the cam stop lever (77) causing the mechanism to be shut off and to move the pivot lever assembly away from the spindle, thereby disengaging the cycle idler wheel from the turntable hub.



A PHOTOFACT "EXPLODED" VIEW

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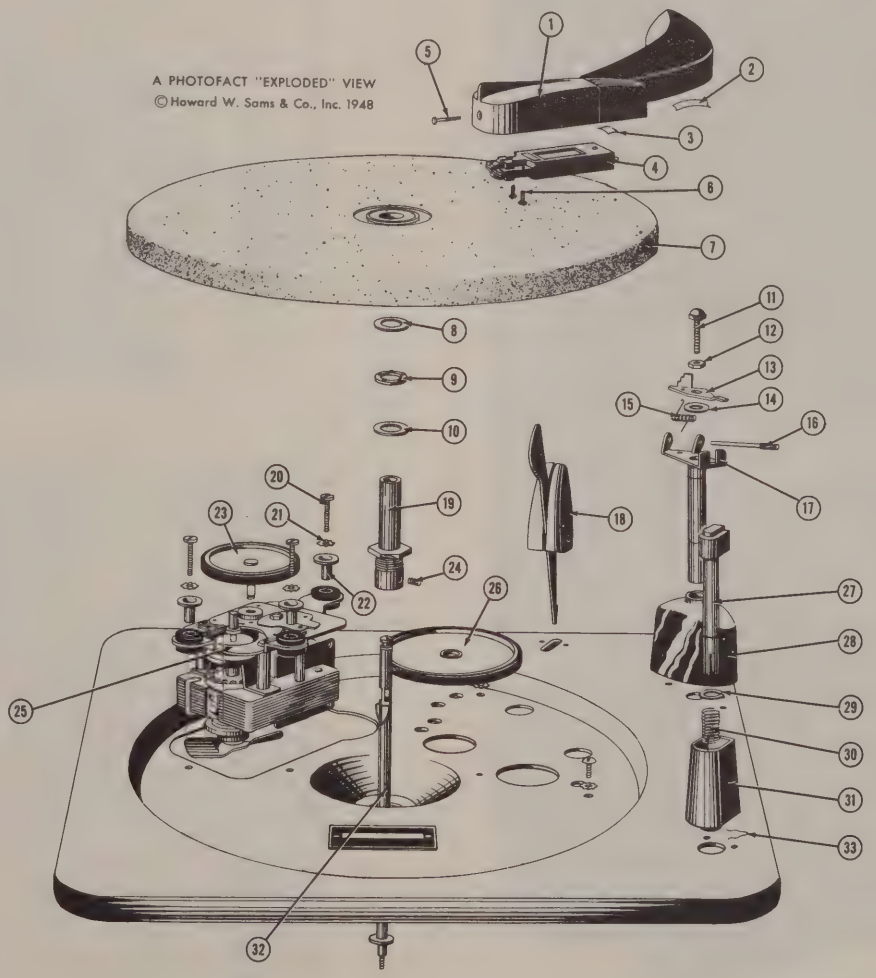
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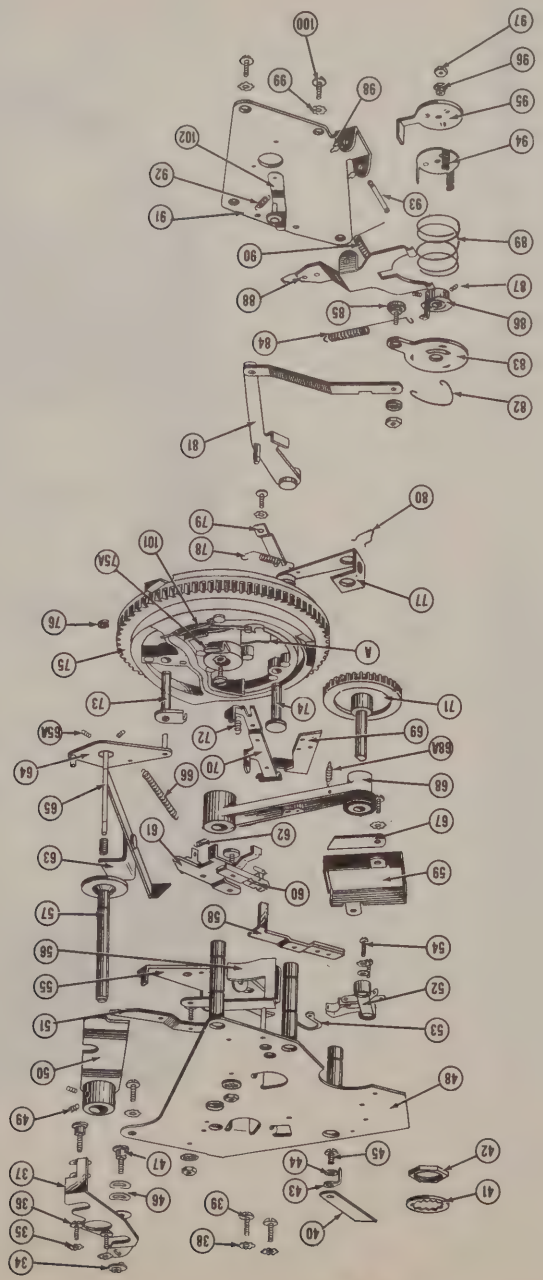
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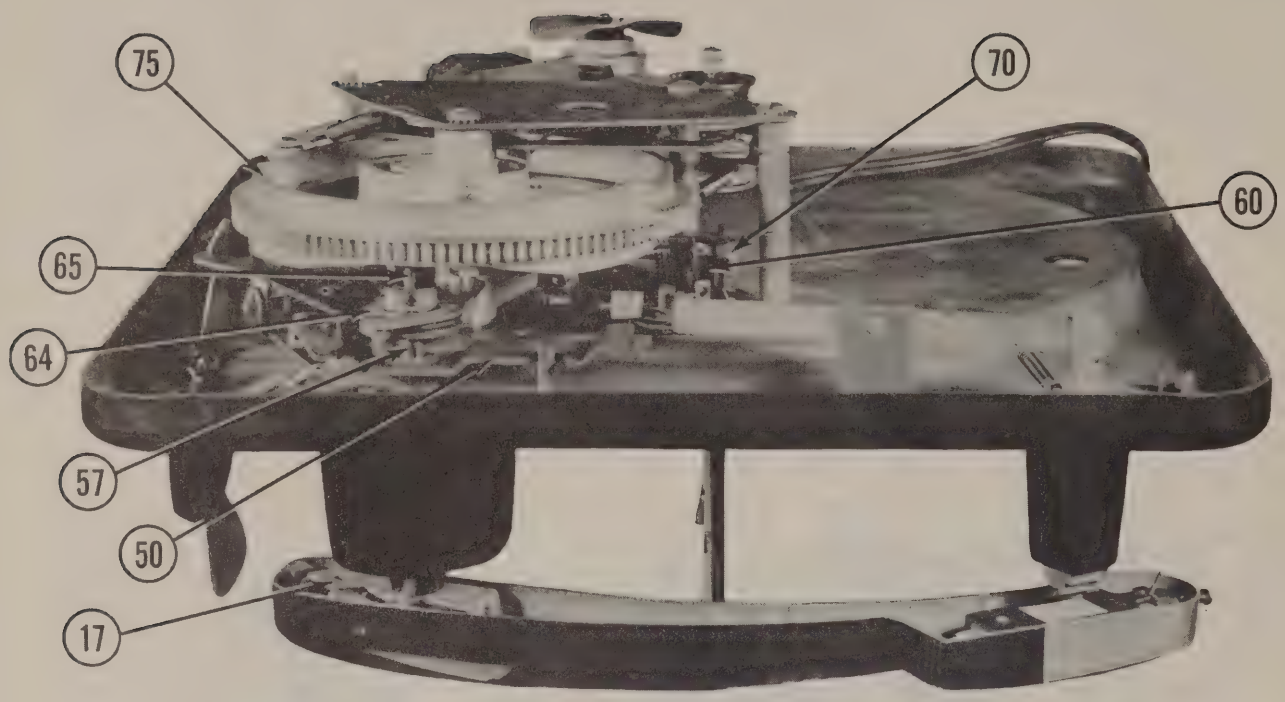


BOTTOM—SIDE VIEW

TROUBLES AND ADJUSTMENTS

Pickup Arm Does Not Move During the Change Cycle

1. Height adjusting screw (11) and nut (12) are loose.

2. Arm-operating lever (64) loose on the shaft (65).

When resetting the pickup arm height adjustment, make sure the positioning lever (13) engages the milled flats on the middle sleeve assembly (57).

Adjust the screw (11) so that the pickup arm clears the reject button (27) by a minimum of 3/64" and just clears flock on the turntable. If the correct height cannot be obtained, the following adjustment is necessary:

(a) Disconnect the power plug.

(b) Press the reject button and rotate the turntable by hand until the pickup arm is in play position.

(c) Loosen the two set screws (65A) and insert a .010" feeler gauge between the rubbered clutch surface of the middle sleeve assembly (57) and the arm-operating lever (64).

(d) Press up on the arm-operating lever assembly (64) to its full extent of travel.

(e) Using long-nose pliers, pull down the operating-arm shaft (65) until it touches the cam.

(f) With continued pressure on the bottom of the arm-operating lever assembly (64) (by the left thumb), push down on the pickup arm (with the left fingers) as far as it will go. Be sure the pickup arm is clear of the reject button.

(g) Tighten the set screws, and remove the feeler gauge.

Needle Does Not Position Properly on 10-Inch and 12-Inch Records

Proper adjustment of the pickup arm can be made by rotating the eccentric screw (34) located back of the pickup arm post on the top of the base plate.

1. Rotate the screw clockwise, or counterclockwise, until the condition is corrected.

2. If the pickup arm is irregular in dropping action, check the following:

(a) Check for grease or foreign matter between the clutch surfaces of the sleeve assembly (57) and the arm-operating lever (64).

(b) Check the height adjusting screw (11) to see if it is tight.

(c) Arm-operating lever (64) loose on the middle sleeve assembly (57).

(d) Check the pin guide lever (75A) to see if it coincides with the top inside surface of the cam track.

Changer Cycles Continuously

1. Button retaining spring (79) loose or too weak to actuate the locking button (74).

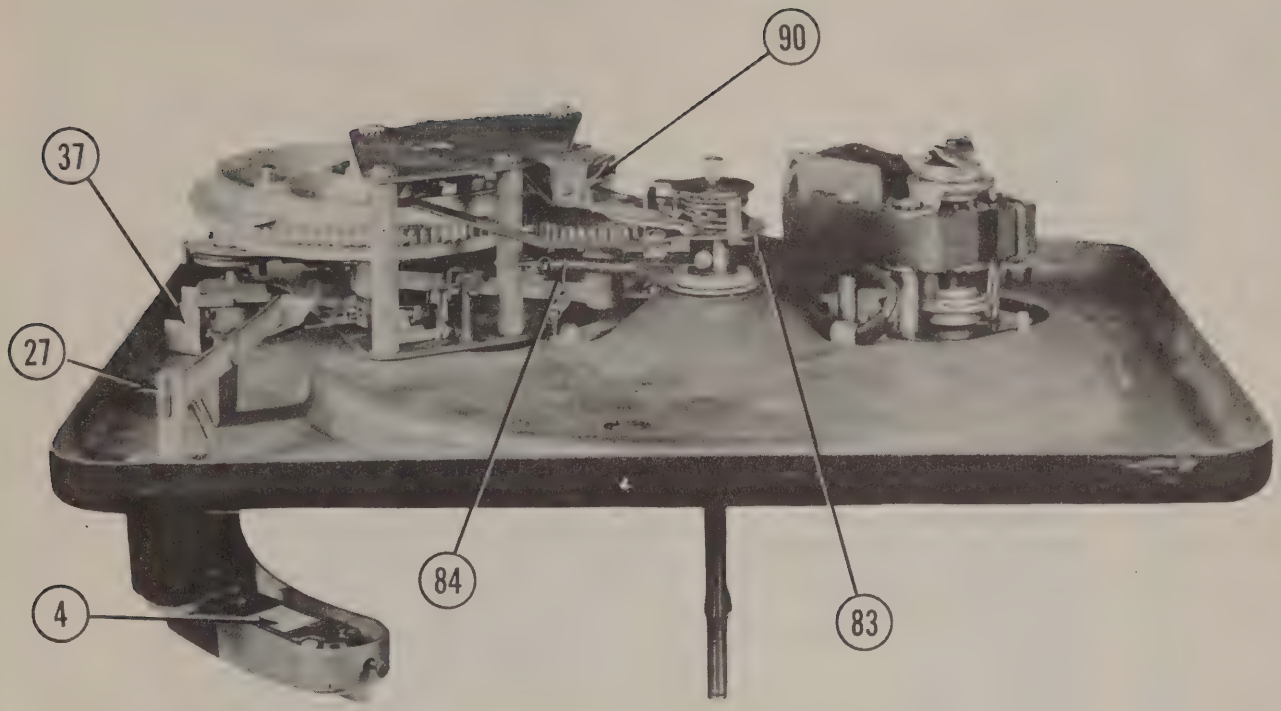
2. Reject button (27) binding.

3. Hinge lever bracket (60) binding.

Pickup Arm Drops for Wrong Size Record

Changer drops 12-inch records but pickup arm positions for 10-inch records.

1. Tension spring of the discriminator lever (55) loose; as a result, the discriminator lever stays in a latched position



BOTTOM—FRONT VIEW

with the post assembly (18), which prevents the positioning lever (51) from being blocked. This allows the positioning lever to contact the short pin on the arm-operating lever (64) causing the long pin to follow into the 10-inch track.

Changer drops 10-inch records but pickup arm positions for 12-inch records.

(a) Check the discriminator lever (55); does not block the position lever (51).

(b) Check the positioning lever (51) to see that it is not bent up, so that it passes over the short pin on the arm-operating lever (54).

(c) Check the spring tension of positioning lever (51) to see that it is strong enough to guide arm-operating lever assembly (64) into 10-inch track.

Changer Stalls in Cycle But Turntable Continues to Turn

1. Grease, or foreign matter, on the turntable hub and cycle idler wheel (26). Clean with carbon tetrachloride.

Turntable Speed Irregular

1. Grease, or foreign matter, on the turntable rim and the idler pulley (23). Clean with carbon tetrachloride.

Changer Shuts Off Before All the Records Have Been Played

1. The spring catch mounted on the end of the shut-off lever (88) bent down; as a result, the shut-off trip pawl (102) will not be held in a locked position.

Changer Fails to Shut Off on Completion of Last Record

1. Spring finger on the shut-off lever assembly (88) bent up; therefore, the pawl (102) is not released.
2. Spindle assembly binding preventing the spindle from having any vertical travel.

LUBRICATION

These changers are lubricated at the factory and should not require any additional lubrication; however, should it become necessary to lubricate the changer, due to excessive use or high operating temperatures, the changer should be lubricated as follows:

Use a good light grease on the

1. Bearing assembly (9).
2. Fixed spindle lever (95).

The fixed spindle lever should be checked for adequate greasing if the changer becomes sluggish in cycle. Insert Lubriplate, mixed with graphite, between the fixed spindle lever (95) and the spindle cage (94) if the fault occurs.

3. Spindle cage plate (83).
4. Outer sleeve assembly (32D).
5. Cam assembly (75).

Do not allow any grease to come in contact with the clutch surfaces of the middle sleeve assembly (57) and the arm-operating lever (64), the rubber tires of the idler pulley (23) and cycle idler wheel (26) and their drive surface. If grease should contact these parts, clean them with carbon tetrachloride.

PARTS LIST

Ref. No.	Part No.	DESCRIPTION
1	R57433	Pickup arm
2	R57552	Long retaining clip
3	R57553	Short retaining clip
4	R52826	Cartridge—Astatic (L-70)
5	R52974	Needle holding screw
6	R57383	Screw No. 4-40 x ¼ fil. hd.
7	R57344	Turntable assembly
8	R57382	Turntable bearing washer
9	R57448	Bearing assembly
10	R57382	Turntable bearing washer
11	R57447	Pickup arm height adjusting screw—special No. 8-32
12	R411-6	Hex nut No. 6-32
13	R57440	Pickup arm positioning lever
14	R57379	Outer sleeve assembly washer
15	R57457	Pickup arm hinge spring
16	R57444	Pickup arm hinge pin
17	R57459	Pickup arm outer sleeve assembly
18	R57461	Discriminator post assembly
19	R57449	Spindle mounting bushing assembly
20	R203-12	Screw No. 6-32 x ¾ bd. hd.
21	R401-6	Lock washer No. 6 ext. tooth
22	R41146	Motor mounting spacer
23	R46350	Idler pulley—General Industries motor
	R49655	Idler pulley—Russell
	R49662	Idler pulley—Alliance
24	R57378	Spindle locking screw
25	R57472	Phono-motor—General Industries 60 cycle
	R57473	Phono-motor—Russell 60 cycle
	R57474	Phono-motor—Alliance 60 cycle
26	R57424	Cycle idler wheel
27	R57458	Reject button assembly
28	R57477	Pickup arm post
29	R13335	"C" washer
30	R57445	Button post compression spring
31	R57478	Reject button post
32	R57455	Spindle assembly
32A	R57332	Spindle cap assembly
32B	R57481	Spindle cap spring
32C	R57355	Record support finger
32D	R57454	Outer sleeve assembly
33	R57446	Reject button retaining clip
34	R57484	Adjusting eccentric
35	R401-6	Lock washer No. 6 ext. tooth
36	R203-4	Reject post mounting screw No. 6-32 x ¼
37	R57486	Adjusting lever
38	R401-6	Lock washer No. 6 ext. tooth
39	R203-5	Discriminator post mounting screw No. 6-32 x 5/16 bd. hd.
40	R57498	Adjusting plate
41	R402-28	Lock washer—⅜ int. tooth
42	R57395	Hex nut—⅜-24 spindle mounting bushing assembly
43	R55833	Spring mounting terminal
44	R400-6	Lock washer No. 6 split
45	R203-4	Adjusting plate mounting screw No. 6 x ¼ bd. hd.
46	R57487	Spring washer
47	R57485	Long-shouldered screw No. 6-32
48	R57421	Top plate assembly
49	R374-6	Set screw No. 8-32 x 3/16
50	R57425	Ratchet lever assembly
51	R57368	Positioning lever
52	R57405	On-off switch
53	R57499	Spring mounting washer
54	R202-7	Screw—No. 4-40 x 7/16 bd. hd.
55	R57341	Discriminator lever
56	R57366	Positioning lever
57	R57456	Pickup arm middle sleeve assembly
58	Part of Item 48	Switch shut-off lever
59	R57401	Switch cover
60	R57631	Hinge lever bracket assembly
61	R57423	Hinge trip lever assembly
62	R57600	Ratchet pawl spring
63		Part of base plate manual trip lever
64	R57426	Arm operating lever assembly
65	R57439	Arm operating shaft
65A	R372-8	Set screw No. 4-40 x ¼
66	R57606	Arm operating lever spring
67	R57498	Adjusting plate
68	R57630	Pivot lever assembly
68A	R57602	Pivot lever spring
69	R57394	Stop bracket
70	R57371	Hammer lever
71	R57420	Pinion assembly
72	R57601	Hammer lever spring
73	R57457	Shut-off button assembly
74	R57414	Locking button
75	R57465	Cam assembly
75A		Part of item 75
76	R40951	Retaining washer
77	R57416	Cam stop lever assembly
78	R57609	Cam stop lever spring
79	R57411	Button retainer spring
80	R57446	Retaining clip
81		Finger operating lever assembly (part of item 91)
82	R57381	Spindle cage retaining spring
83	R57361	Spindle cage plate
84	R57603	Finger return spring
85	R57376	Spindle cage plate shoulder screw No. 6-32
86	R57430	Spindle hub and lever assembly
87	R372-5	Set screw No. 4-40 x 5/32
88	R57418	Shut-off lever assembly
89	R57429	Spindle assembly compression assembly
90	R57608	Shut-off lever spring
91	R57419	Bottom plate assembly—complete
92	R57604	Shut-off pawl spring
93	R57353	Shut-off lever spring
94	R57362	Spindle cage
95	R57363	Fixed spindle lever
96	R57452	Shouldered nut No. 3-48
97	R57453	Special nut No. 3-48
98	R16503	Retaining clip
99	R401-6	Lockwasher No. 6 ext. tooth
100	R203-5	Screw No. 6-32 x 5/16 bd. hd.
101		Tracking spring (part of item 75)
102		Shut-off trip pawl (part of item 91)
	R57464	Guide lever spring
	R57605	Hinge lever spring
	R57365	Discriminator lever pin
	R57658	Shouldered screw No. 8-32
	R57598	Tension spring
	R57599	Positioning lever spring
	R57489	Discriminator trip lever pin
	R57610	Discriminator trip lever spring
	R57374	Discriminator trip lever
	R372-5	Set screw No. 4-40 x 5/32
	R57443	Neoprene clutch washer
	R374-6	Set screw No. 8-32 x 3/16
	R57598	Top plate assembly tension spring
	R57572	Mounting plate compression spring
	R57396	Spindle locking flat washer
	R57574	Shipping spacer washer (Model 101.763)
	R64662	Spring mounting felt washer (Model 101.763)
	R57492	Bottom pan assembly (Model 101.763)

PHOTOFACT* Folder

*TRADE MARK

TELEKING MODELS
410, 512, 612, 710

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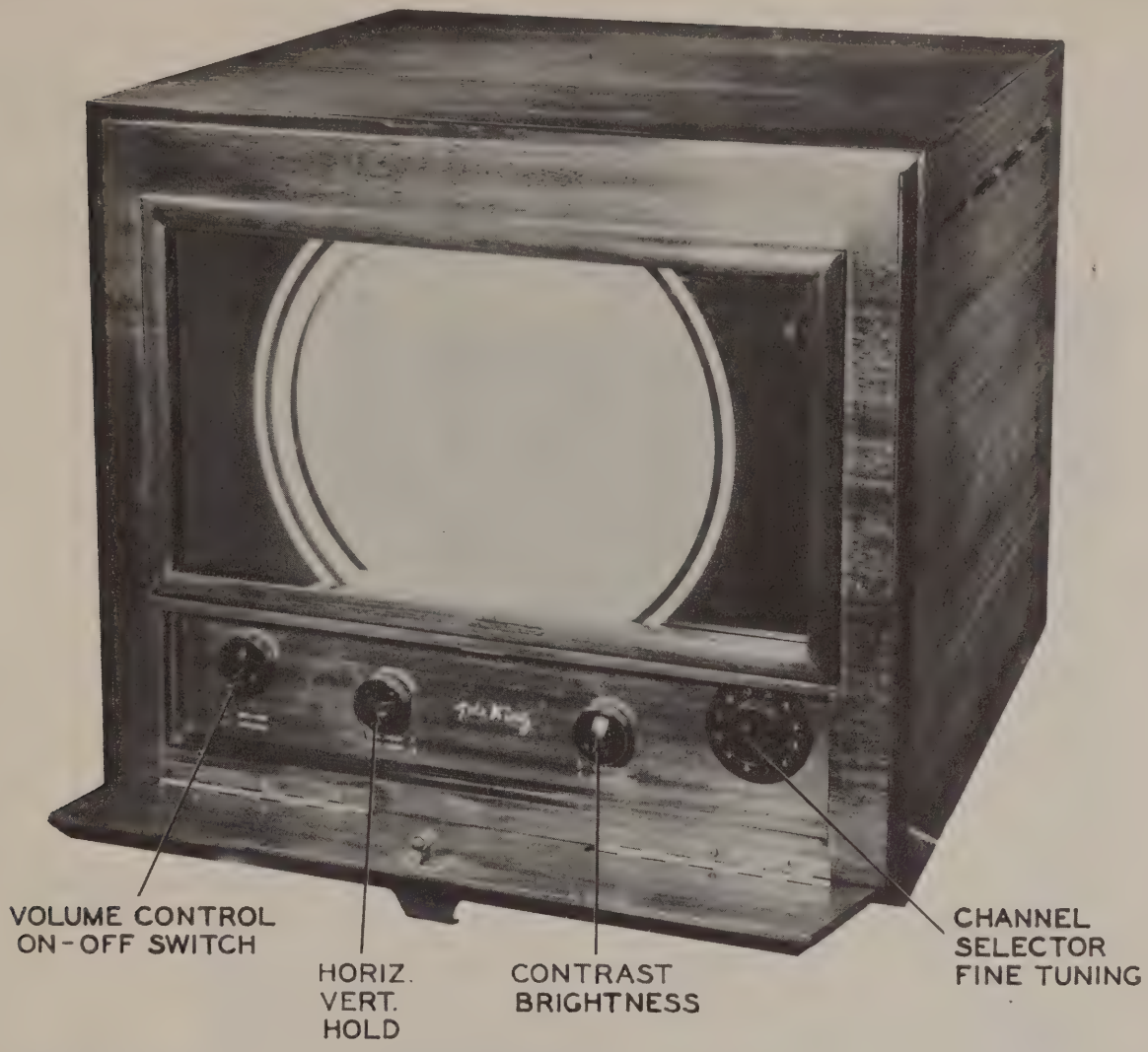

TELE KING
MODELS 410, 512, 612, 710

TELE KING MODEL 410

TRADE NAME	Tele King Models 410, 512, 612, 710
MANUFACTURER	Tele King Corp., 601 W. 26th St., New York 1, New York
TYPE SET	Television Receiver
TUBES	Twenty
POWER SUPPLY	110-120 Volts AC-60 Cycle — RATING 1.62 Amp. at 117 Volts AC
TUNING RANGE	Channels 2 thru 13

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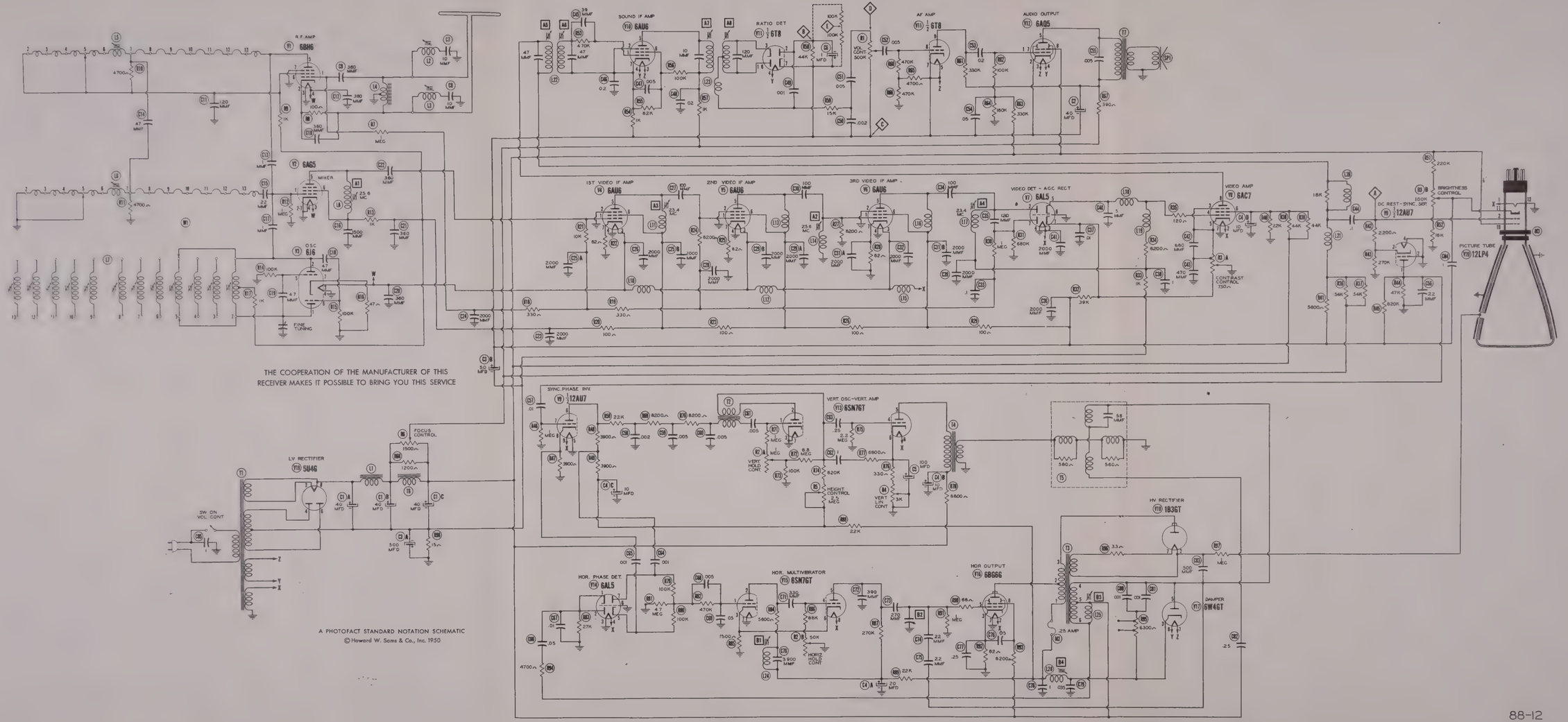

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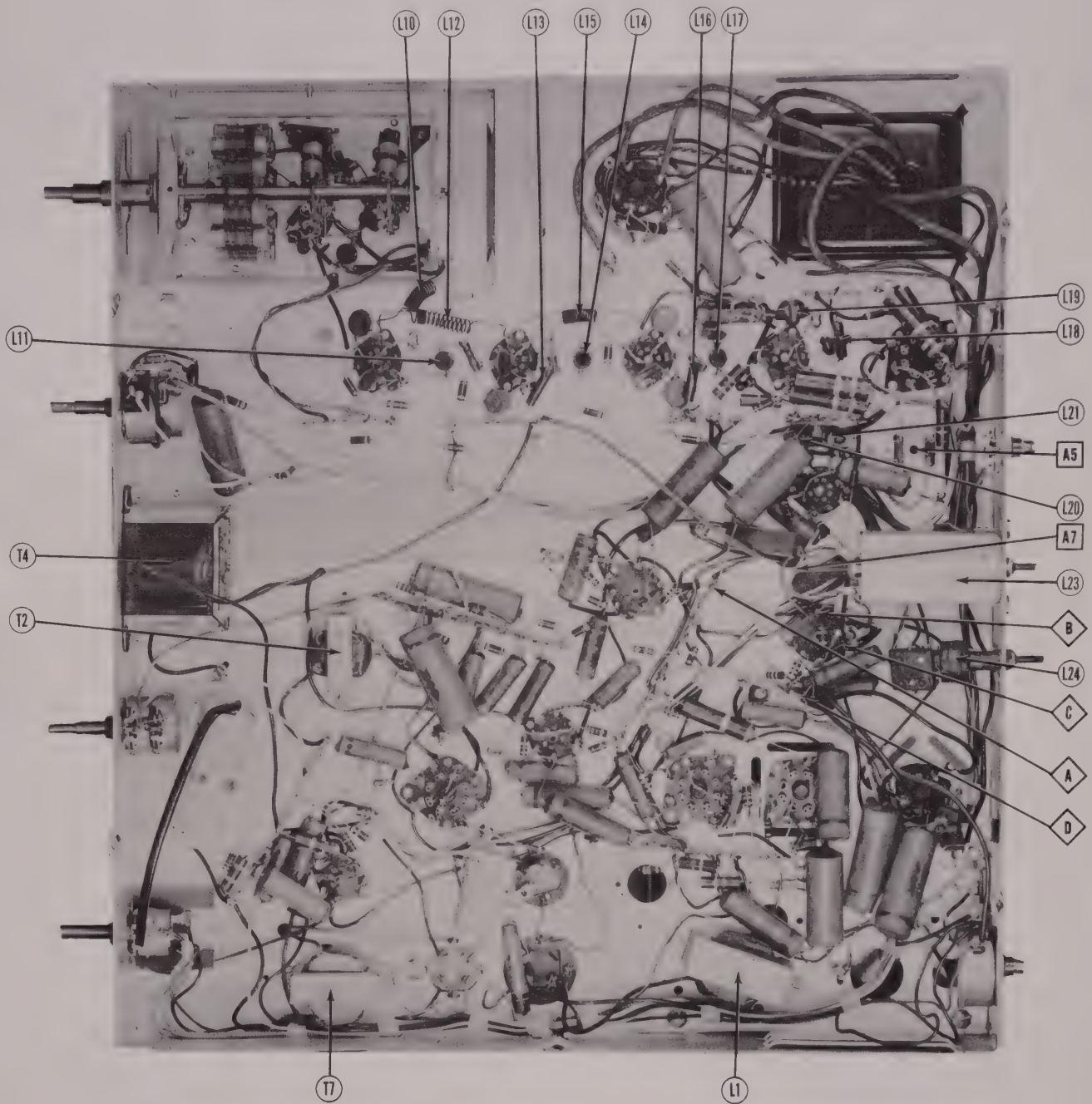
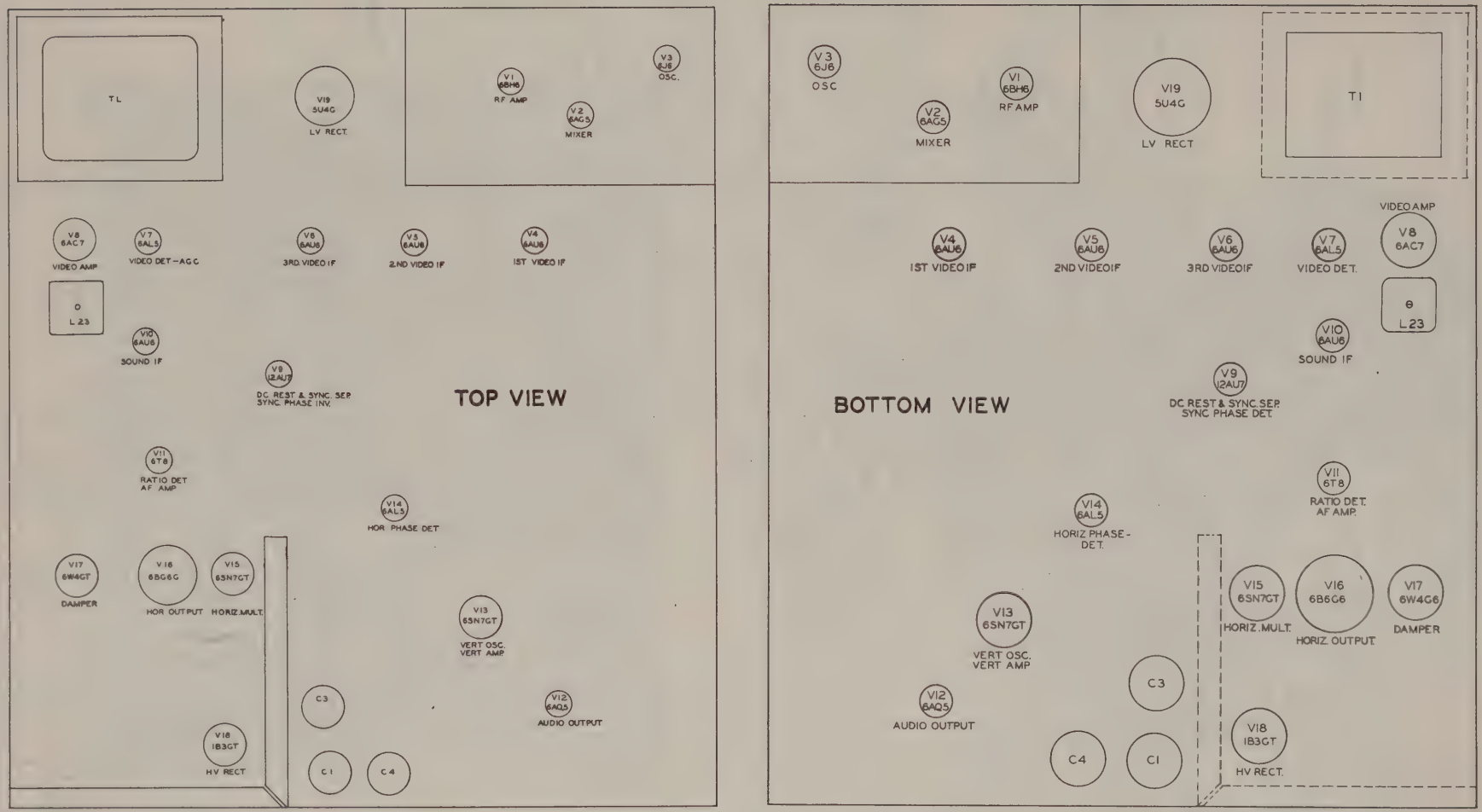
TELE KING
MODELS 410, 512, 612, 710

CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To eliminate the high voltage shock hazard remove the horizontal oscillator tube (V15) from its socket.

VIDEO IF ALIGNMENT

The use of a VTVM with an AC scale is necessary to align the video IF stages, do not attempt to connect the VTVM across the diode load resistor. Remove the local oscillator tube (V3) from its socket to prevent erroneous indications. Set the contrast control to slightly less than maximum clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	25.6MC (400 ~ AM modulated)	Any	AC Probe to Point (A) Common to chassis. (see instructions above)	A1, A2	Adjust for maximum deflection.
2.	Direct	"	23.4MC (400 ~ AM modulated)	"	"	A3, A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	25MC (10MC SWP)	26.1MC 25.6MC 22.6MC 21.6MC	Any	Vert. Amp. to Point (A) Low side to chassis.		Check for response curve similar to Fig 1 with markers as shown. If necessary retouch A1 thru A4 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect a matched pair of 100KΩ resistors between points B, and C. The junction of these resistors is alignment point E.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to pin 4 (Grid) of 6AC7 (V8). Low side to chassis.	4.5MC (Unmod.)	Any channel not used locally	DC Probe to Point (B) Common to Point (C)	A5, A6, A7	Adjust for maximum deflection.
5.	.01MFD	"	"	"	DC Probe to Point (D) Common to Point (E)	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ~ modulation and 450KC sweep. Use 120 ~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to pin 4 (Grid) of 6AC7 (V8). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any channel not used locally.	Vert. Amp. to Point (B) Low side to chassis.	A5, A6, A7	Disconnect stabilizer capacitor C6. Adjust for maximum amplitude and symmetry as per Fig 2.
5.	.01MFD	"	"	"	"	Vert. Amp. to Point (D) Low side to chassis.	A8	Reconnect capacitor C6. Adjust A8 so 4.5MC occurs at center of crossover lines as per Fig 3. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

TUNER ALIGNMENT

The circuits in the tuner have been pre-set at the factory and are sufficiently broad and should not require adjustment in the field.

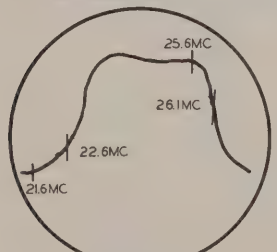


FIG. 1

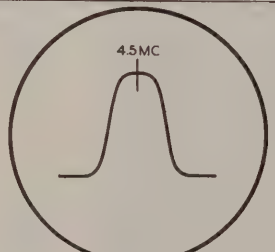


FIG. 2

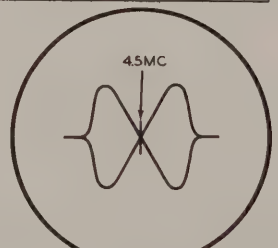


FIG. 3

HORIZONTAL OSCILLATOR ADJUSTMENTS

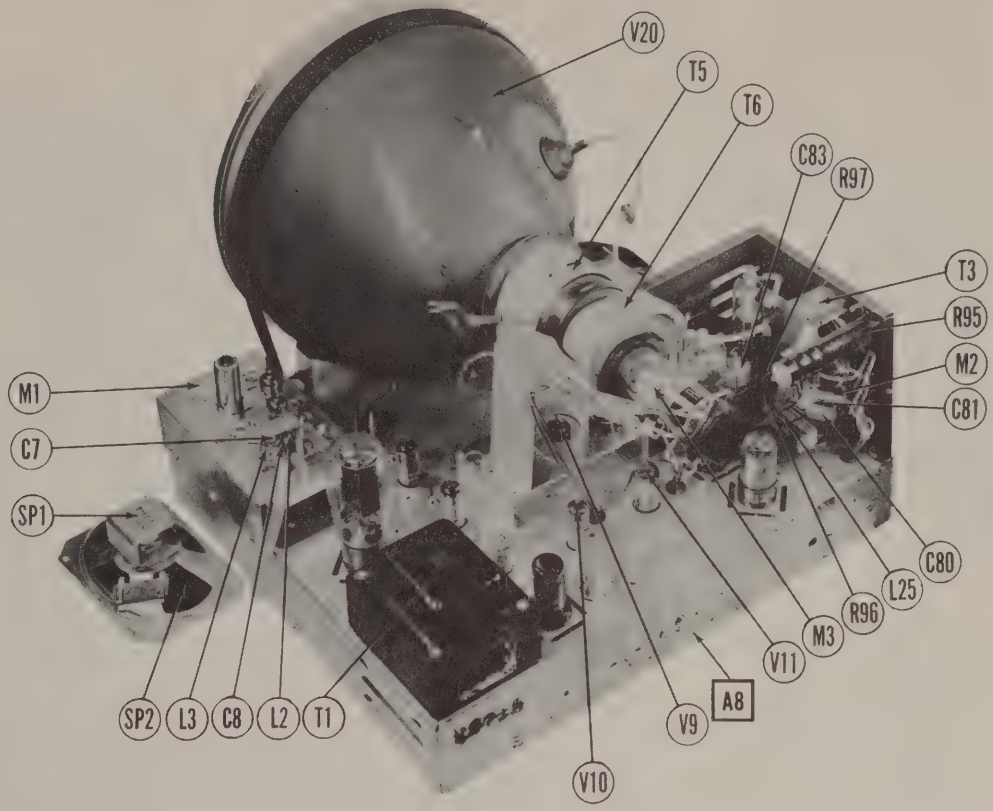
Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control to the mid position of its range. Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

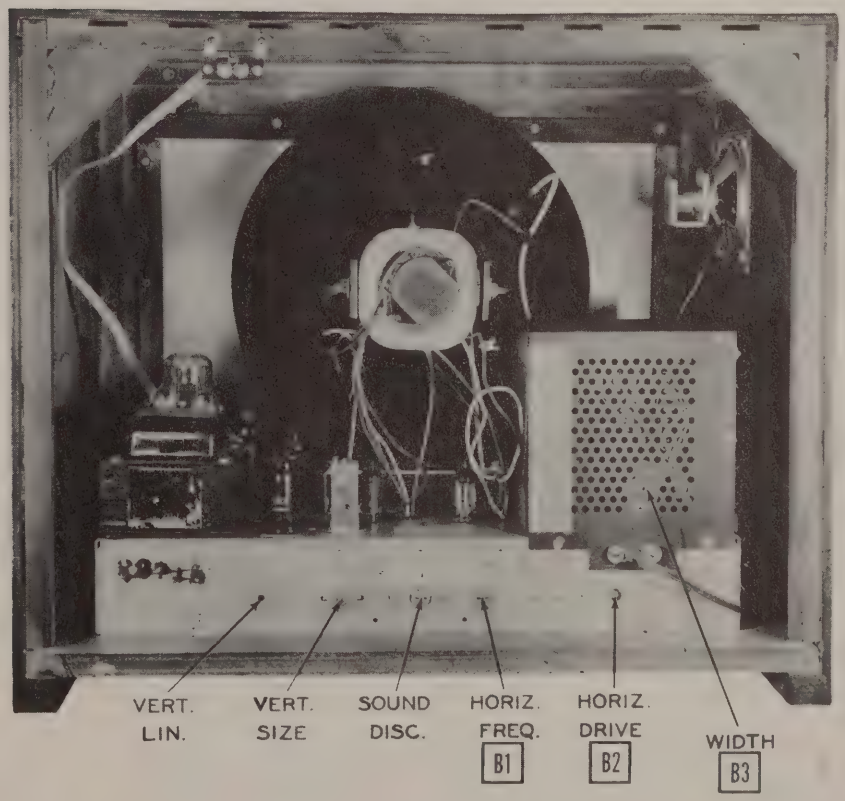
Turn the horizontal drive trimmer (B2) clockwise as far as possible without crowding the right side of the picture.

Adjust the width slug (B3) until the picture fills the mask horizontally.

Adjust the horizontal linearity slug until the picture is symmetrical from left to right, readjustment of B2 may be required to obtain optimum results.



CHASSIS-TOP VIEW



CABINET-REAR VIEW

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BH6	-.4VDC	.1VDC	0V.	6.3VAC	110VDC	110VDC	0V.		
V 2	6AG5	-1VDC	0V.	6.3VAC	0V.	110VDC	110VDC	0V.		
V 3	6J6	95VDC	95VDC	6.3VAC	0V.	§-2.2VDC	§-2.5VDC	.4VDC		
V 4	6AU6	-1.9VDC	0V.	6.3VAC	0V.	110VDC	110VDC	.2VDC		
V 5	6AU6	-.1VDC	0V.	6.3VAC	0V.	110VDC	110VDC	.2VDC		
V 6	6AU6	0V.	0V.	6.3VAC	0V.	110VDC	110VDC	.4VDC		
V 7	6AL5	0V.	-3VDC	6.3VAC	0V.	-1.6VDC	0V.	-.6VDC		
V 8	6AC7	0V.	6.3VAC	2.8VDC	-2.5VDC	2.8VDC	185VDC	0V.	110VDC	
V 9	12AU7	2.8VDC	0V.	.7VDC	0V.	0V.	340VDC	0V.	17VDC	6.3VAC
V 10	6AU6	†1.1VDC	†7.2VDC	†0V.	†6.3VAC	350VDC	360VDC	†7.2VDC		
V 11	6T8	†-.4VDC	†-.8VDC	†-.4VDC	†6.3VAC	†0V.	0V.	†0V.	†0V.	†85VDC
V 12	6AQ5	†-.6VDC	†0V.	†0V.	†6.3VAC	†145VDC	†180VDC	†-.6VDC		
V 13	6SN7GT	-20VDC	75VDC 185VDC	0V.	0V.	290VDC	5VDC 15VDC	0V.	6.3VAC	
V 14	6AL5	0V.	0V.	0V.	6.3VAC	1.8VDC	0V.	-1.2VDC		
V 15	6SN7GT	.1VDC	250VDC	10VDC	0V.	105VDC	10VDC	0V.	6.3VAC	
V 16	6BG6G	0V.	6.3VAC	7VDC	0V.	-4VDC	0V.	0V.	250VDC	
V 17	6W4GT	0V.	0V.	430VDC	0V.	360VDC	380VDC	†0V.	†6.3VAC	
V 18	1B3GT	* DO NOT MEASURE.								
V 19	5U4G	0V.	390VDC	0V.	380VAC	-3VDC	380VAC	0V.	390VDC	
V 20	12LP4	6.3VAC	1.3VDC	PIN 10 360VDC	PIN 11 110VDC	PIN 12 0V.				

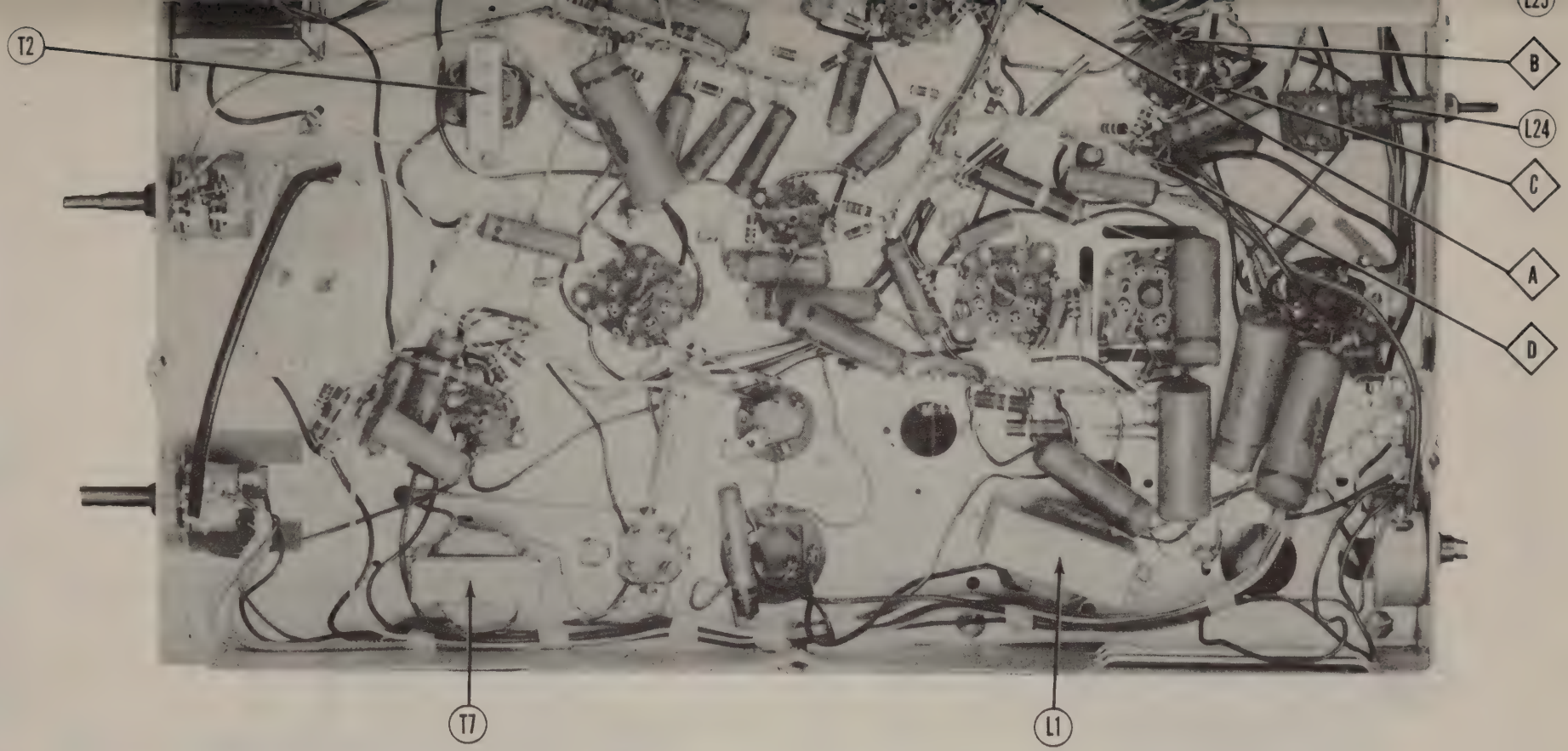
§ TAKEN WITH VACUUM TUBE VOLTMETER.
* DO NOT MEASURE.
† MEASURED FROM PIN 2 OF V12.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BH6	2.6 Meg.	100Ω	0Ω	.1Ω	†1000Ω	†1000Ω	0Ω		
V 2	6AG5	1 Meg.	0Ω	.1Ω	0Ω	†1000Ω	†1000Ω	0Ω		
V 3	6J6	†1000Ω	†1000Ω	.1Ω	0Ω	100KΩ	100KΩ	47Ω		
V 4	6AU6	1.6 Meg.	0Ω	.1Ω	0Ω	†300Ω	†300Ω	82Ω		
V 5	6AU6	1.6 Meg.	0Ω	.1Ω	0Ω	†200Ω	†200Ω	82Ω		
V 6	6AU6	.1Ω	0Ω	.1Ω	0Ω	†100Ω	†100Ω	82Ω		
V 7	6AL5	1.5Ω	1000Ω	.1Ω	0Ω	9KΩ	0Ω	680KΩ		
V 8	6AC7	0Ω	.1Ω	750Ω	9.2KΩ	750Ω	22KΩ	0Ω	†5.6KΩ	
V 9	12AU7	47KΩ	0Ω	270KΩ	0Ω	0Ω	#32KΩ	1 Meg.	3.9KΩ	.1Ω
V 10	6AU6	†470KΩ	†1000Ω	†0Ω	†.1Ω	¶1000Ω	¶55KΩ	†1000Ω		
V 11	6T8	†Inf.	†44KΩ	†Inf.	†.1Ω	†0Ω	Inf.	†0Ω	†470KΩ	¶330KΩ
V 12	6AQ5	250KΩ	†0Ω	†0Ω	†.1Ω	¶1000Ω	¶200Ω	250KΩ		
V 13	6SN7GT	2 Meg.	#2.5 Meg. #900KΩ	0Ω	2.2 Meg.	¶8KΩ	3.3KΩ 330Ω	0Ω	.1Ω	
V 14	6AL5	27KΩ	27KΩ	0Ω	.1Ω	4.8 Meg.	0Ω	4.8 Meg.		
V 15	6SN7GT	5.1 Meg.	#28KΩ	1.5KΩ	110KΩ	#300KΩ	1.5KΩ	0Ω	.1Ω	
V 16	6BG6G	Inf.	.1Ω	82Ω	0Ω	1 Meg.	Inf.	0Ω	¶8.5KΩ	TOP CAP #200Ω
V 17	6W4GT	Inf.	Inf.	50KΩ	Inf.	¶220Ω	¶230Ω	†0Ω	†.1Ω	
V 18	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #360Ω
V 19	5U4G	Inf.	20KΩ	Inf.	60Ω	15Ω	58Ω	Inf.	20KΩ	
V 20	12LP4	.1Ω	270KΩ	PIN 10 ¶200Ω	PIN 11 80KΩ	PIN 12 0Ω				

† MEASURED FROM PIN 2 OF V12.
# MEASURED FROM PIN 3 OF V17.
¶ MEASURED FROM PIN 8 OF V19.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



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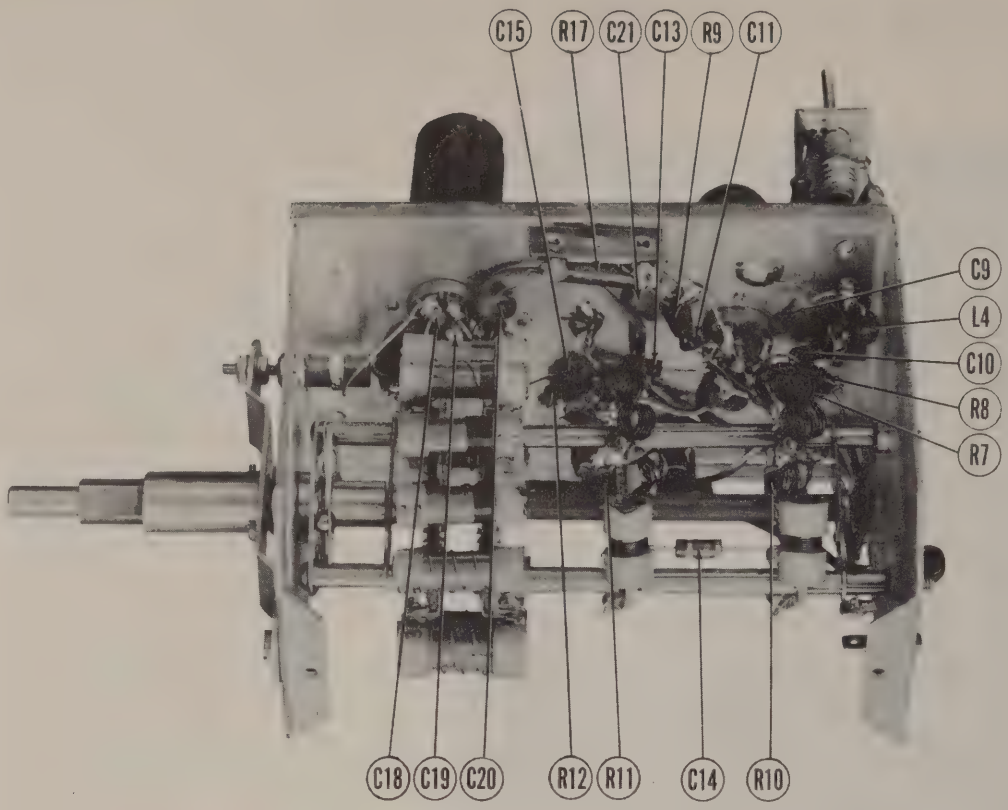
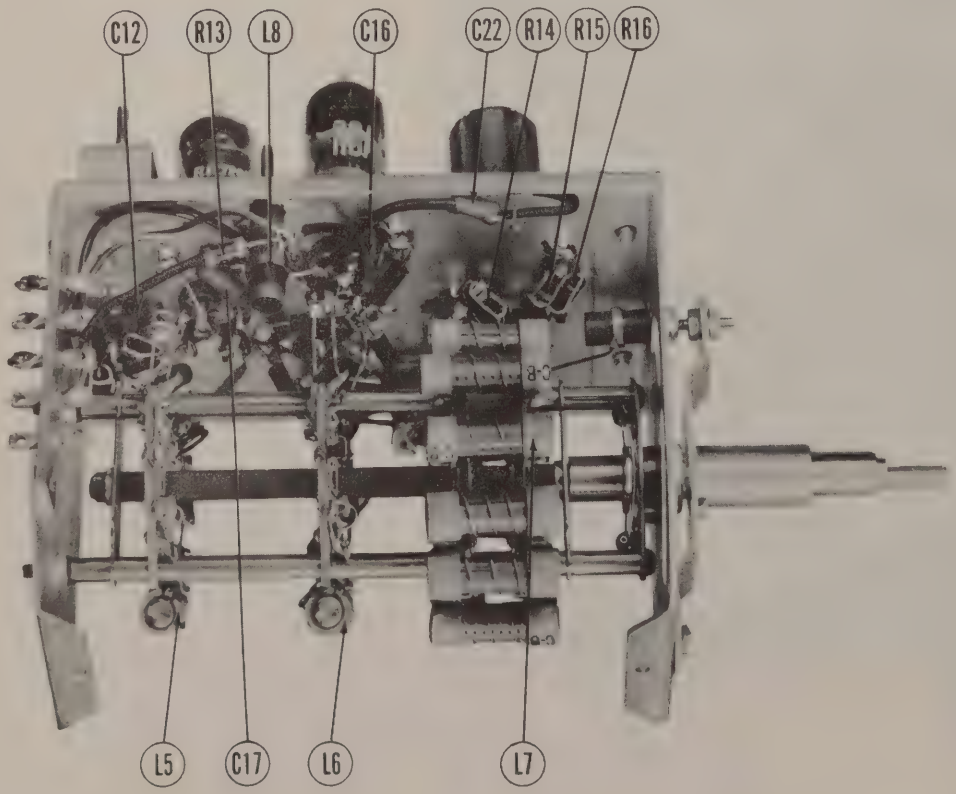
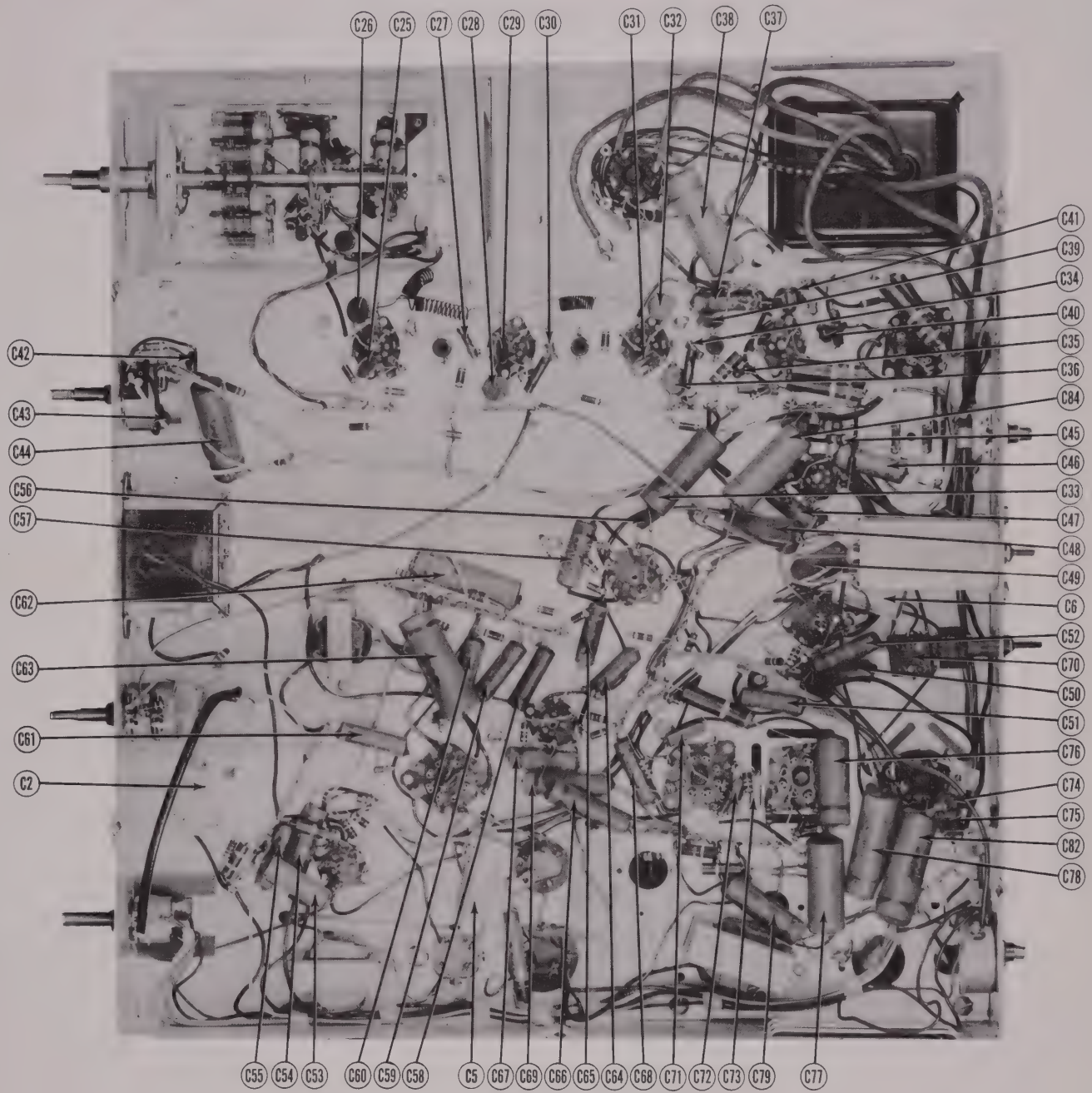


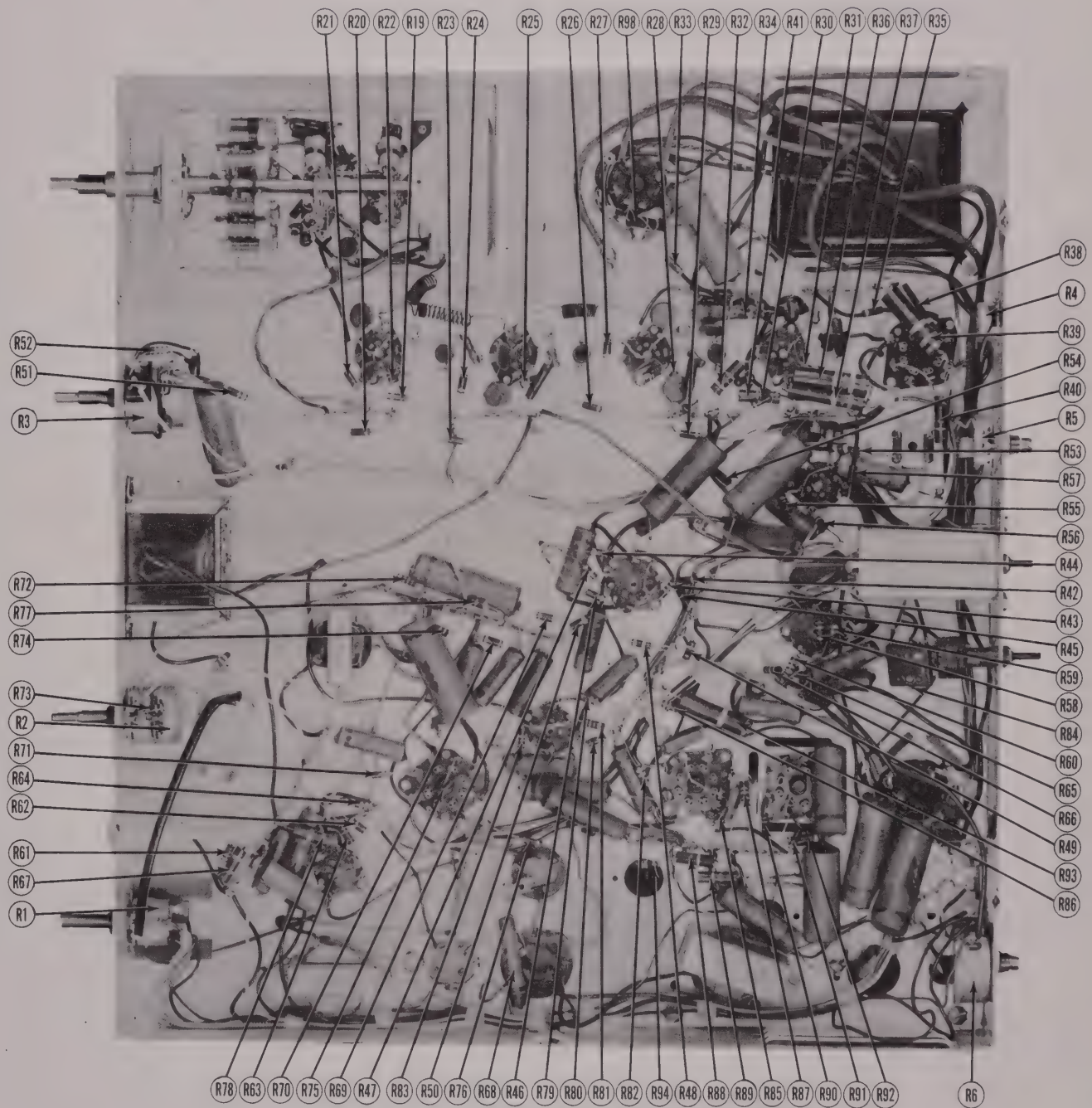
RF TUNER-RIGHT SIDE



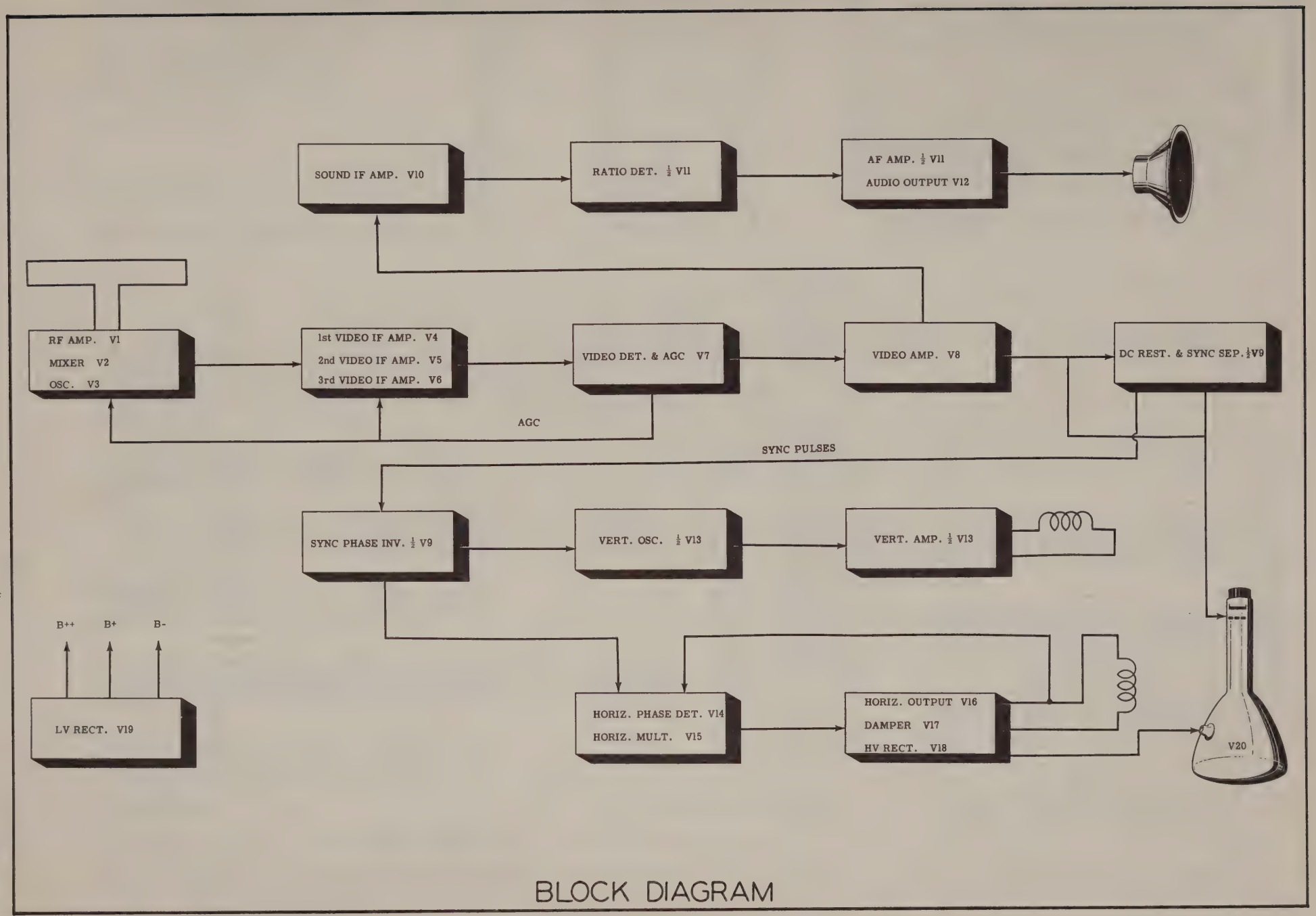
RF TUNER-LEFT SIDE



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



BLOCK DIAGRAM

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: TELE-KING PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6BH6	6BH6	7CM	
V2	Mixer	6AG5	6AG5	7BD	
V3A	Oscillator	6J6	6J6	7BF	
B	Oscillator	6C4	6C4	6BG	
V4	1st Video IF	6AU6	6AU6	7BK	
V5	2nd Video IF	6AU6	6AU6	7BK	
V6	3rd Video IF	6AU6	6AU6	7BK	
V7	Video Det. -AGC Rectifier	6AL5	6AL5	6BT	
V8	Video Amp.	6AC7	6AC7	8N	
V9	DC Restorer-Sync. Sep. -Phase Inv.	12AU7	12AU7	9A	
V10	Sound IF Amp.	6AU6	6AU6	7BK	
V11	Ratio Det. -AF Amp.	6T8	6T8	9E	
V12	Audio Output	6AQ5	6AQ5	7BZ	
V13	Vert. Osc. -Vert. Amp.	6SN7GT	6SN7GT	8BD	
V14	Hor. Phase Det.	6AL5	6AL5	6BT	
V15	Hor. Multivib.	6SN7GT	6SN7GT	8BD	
V16	Hor. Output	6BG6G	6BG6G	5BT	
V17	Damper	6W4GT	6W4GT	4CG	
V18	HV Rectifier	1B3GT	1B3GT	3C	
V19	LV Rectifier	5U4G	5U4G	5T	
V20A	Picture Tube	12LP4	12LP4	12D	
B	Picture Tube	10BP4	10BP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TELE-KING PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	CEM-5	AFH888J	UP11CJ1098		TVL-304	▪ Filter
B	40	450						■ Filter
C	40	450						▲ Filter
C2	40	450	CET-4	E26D67	BR4045A		TVA-24	Output Decoupling
C3A	500	5	CEM-7	AFH100T10D	UP5015		EL-52	■ Bias Filter
B	50	150			BRH605		UT-501	▲ Decoupling
C4A	20	450	CEM-6	AFH422J2D	UP8DJ1112		EL-410†	▪ Decoupling
B	10	450					TVA-21	■ Vert. Output Decoupling
C	10	450						▲ Decoupling
D	10	450						V. Amp. Screen Bypass
C5	100	25	CET-5	PRS25/100	BRH251A		TVA-8	Vert. Output Cath. Bypass
C6	1	25	CET-6	E26E42	BR145		TVA-11	Stabilizing Cap.
C7	10			GP10M		NPOK-10		Fixed Trimmer
C8	10			GP10M		NPOK-10		Fixed Trimmer
C9	360			GP360M		GP2K-390		RF Coupling
C10	360			GP360M		GP2K-390		RF Cathode Bypass
C11	120			GP120M		GP2K-120		RF Decoupling
C12	360			GP360M		GP2K-390		RF Filament Bypass
C13	1							RF Coupling
C14	.47							RF Coupling
C15	22			GP22M		GP2K-22		RF Coupling
C16	1500			GP1500M		GP2L-0015		Mixer Decoupling
C17	1							Osc. Coupling
C18	4.7			SI4.7DN750		N750K-5		Osc. Feedback
C19	4.7			SI4.7DN750		N750K-5		Osc. Feedback
C20	360			GP360M		GP2K-390		Osc. Filament Bypass
C21	360			GP360M		GP2K-390		RF Bypass
C22	360			GP360M		GP2K-390		IF Coupling
C23	2000		CC-22	GP2000M	1W5D2	GP2M-002	29C2	Mixer Decoupling *
C24	2000		CC-22	GP2000M	1W5D2	GP2M-002	29C2	AGC Filter *
C25A	2000		CCD-22	GP2000M	1W5D2	GP2M-002	29C5	AGC Filter
B	2000			GP2000M	1W5D2	GP2M-002		1st V. IF Decoupling
C26	2000		CC-22	GP2000M	1W5D2	GP2M-002	29C2	1st V. IF Fil. Bypass
C27	100		CC-31	GP100M	5W5T1	GP1K-100	1FM-31	IF Coupling
C28	2000		CC-22	GP2000M	1W5D2	GP2M-002	29C2	AGC Filter *
C29A	2000		CCD-22	GP2000M	1W5D2	GP2M-002	29C5	2nd V. IF Decoupling
B	2000			GP2000M	1W5D2	GP2M-002		2nd V. IF Fil. Bypass
C30	100		CC-31	GP100M	5W5T1	GP1K-100	29C2	IF Coupling
C31A	2000		CCD-22	GP2000M	1W5D2	GP2M-002	29C5	3rd V. IF Cath. Bypass
B	2000			GP2000M	1W5D2	GP2M-002		3rd V. IF Decoupling
C32	2000		CC-22	GP2000M	1W5D2	GP2M-002	29C2	3rd V. IF Fil. Bypass
C33	.1	600	CP-4-01	P688-1	PTE6P1		TM-1	AGC Filter
C34	100		CC-31	GP100M	5W5T1	GP1K-100	1FM-31	IF Coupling
C35	120		CC-312	GP120M	5W5T15	GP2K-120	1FM-315	IF Coupling
C36	2000		CC-22	GP2000M	1W5D2	GP2M-002	29C2	RF Bypass
C37	.01	400	CP-4-11	P488-01	PTE4S1	821-01	TM-11	DAGC Decoupling
C38	.1	600	CP-4-01	P688-1	PTE6P1		TM-1	Bias Filter
C39	2000		CC-22	GP2000M	1W5D2	GP2M-002	29C2	Bias Filter
C40	5		CC-55	GP5M	5W5V5	NPOK-5	MS-55	V. Diode Filter
C41	2000		CC-22	GP2000M	1W5D2	GP2M-002	29C2	V. Det. -AGC Fil. Bypass
C42	680		CC-368	GP680M	1W5T7	GP2K-680	1FM-375	V. Amp. Cath. Bypass
C43	470		CC-247	GP470M	5W5T5	GP2K-470	1FM-35	V. Amp. Cath. Bypass
C44	.1	600	CP-4-01	P688-1	PTE6P1		TM-1	Video Coupling
C45	39		CC-439	GP39M	5W5Q4	GP1K-39	1FM-44	S. IF Coupling
C46	.02	400	CP-4-12	P488-02	PTE4S2		TM-12	S. IF Decoupling
C47	.005	600	CP-4-25	P688-005	PTE6D5	811-005	TM-25	S. IF Screen Bypass
C48	.02	400	CP-4-12	P488-02	PTE4S2		TM-12	S. IF Decoupling
C49	.001	600	CP-4-21	P688-001	PTE6D1	GP2L-001	TM-21	Diode Load Cap.
C50	.002	600	CP-4-22	P688-002	PTE6D2	GP2M-002	TM-22	De-emphasis
C51	.005	600	CP-4-25	P688-005	PTE6D5	811-005	TM-25	Audio Coupling
C52	.005	600	CP-4-25	P688-005	PTE6D5	811-005	TM-25	Audio Coupling
C53	.02	400	CP-4-12	P488-02	PTE4S2		TM-12	Audio Coupling
C54	.05	400	CP-4-15	P488-05	PTE4S5		TM-15	Bias Filter

CAPACI

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEM: TELE-KING PART No.	REPLACEM: AEROVOX PART No.	C
C55	.005	600	CP-4-25	P688-005	P
C56	22	500	CM-4-22	GP22M	5
C57	.01	600	CP-4-11	P688-01	P
C58	.002	600	CP-4-22	P688-002	P
C59	.005	600	CP-4-25	P688-005	P
C60	.005	600	CP-4-25	P688-005	P
C61	.005	600	CP-4-25	P688-005	P
C62	.1	600	CP-4-01	P688-1	P
C63	.25	400	CP-4-025	P488-25	G
C64	.001	600	CP-4-21	P688-001	P
C65	.001	600	CP-4-21	P688-001	P
C66	.05	400	CP-4-15	P488-05	P
C67	.01	400	CP-4-11	P488-01	P
C68	.005	600	CP-4-25	P688-005	P
C69	.05	400	CP-4-15	P488-05	P
C70	3900	500	CM-239		
C71	330	500	CM-333	GP330M	5
C72	390	500	CM-339	GP390M	5
C73	270	500	CM-327	GP270M	5
C74	22	500		GP22M	5
C75	22	500		GP22M	5
C76	.05	600	CP-6-15	P688-05	P
C77	.25	400	CP-4-025	P488-25	G
C78	.1	600	CO-6-01	P688-1	P
C79	.035	600	CO-6-135	P688-033	
C80	.001	600		P688-001	P
C81	.001	600		P688-001	P
C82	.25	400	CP-4-025	P488-25	G
C83	500	10000	CHV-35		
C84	.1	600	CP-4-01	P688-1	P
C85	.1	600	CP-4-01	P688-1	P

* Not used in all models.
† Some models use 12MMF 1500 volt rating in place
‡ Parallel sections to obtain desired capacity.

C

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TELE-KING PART No.	REPLACEMENT DATA: IRC PART No.	C
R1A	500KΩ	½	P-7	Q13-133	M
B	Switch		Not Req.	76-1	SW
R2A	1 Meg.	½	B11-137 §		
B	50KΩ	½	PD-5	B11-123 §	P
C	Shaft End			E187 §	
R3A	750Ω	2	PD-4		P
B	100KΩ	½			
R4	3000Ω	1			
R5	2.5Meg.	½	P-5	Q11-239	M
R6	1500Ω	3	P-6		10

§ Additional parts to be used with "Concentrikit".
Note 1. Some models use 5000Ω control, part No. P-

R

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TELE-KING PART No.	REPLACEMENT DATA: IRC PART N
R7	1 Meg. 20%	½		
R8	100Ω 5%	½		
R9	1000Ω 20%	½		BTS-1000
R10	4700Ω 5%	½		
R11	4700Ω 5%	½		
R12	1 Meg. 20%	½		
R13	1000Ω 5%	½		BTS-1000
R14	100KΩ	½		
R15	100KΩ	½		
R16	47Ω 20%	½		
R17	1000Ω 20%	1		BTS-1000
R18	330Ω	½	RC-331-2	
R19	330Ω	½	RC-331-2	
R20	100Ω	½	RC-101-2	
R21	10KΩ	½	RC-103-2	
R22	82Ω	½	RC-820-2	
R23	100Ω	½	RC-102-2	
R24	8200Ω	½	RC-822-2	
R25	82Ω	½	RC-820-2	
R26	100Ω	½	RC-101-2	
R27	8200Ω	½	RC-822-2	
R28	82Ω	½	RC-820-2	
R29	100Ω	½	RC-101-2	
R30	1 Meg.	½	RC-105-2	BTS-1 M
R31	680KΩ	½	RC-684-2	BTS-680
R32	39KΩ	1	RC-393-5	BTA-39K
R33	1000Ω 20%	½	RC-102-2	BTS-100
R34	8200Ω	½	RC-822-2	BTS-820
R35	120Ω	½	RC-121-2	
R36	54KΩ	2	RC-543-8	
R37	54KΩ	2	RC-543-8	
R38	44KΩ	2	RC-443-8	
R39	44KΩ	2	RC-443-8	
R40	22KΩ	1	RC-223-5	BTA-22K
R41	5600Ω	1	RC-562-5	BTA-560

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: TELE-KING PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6BH6	6BH6	7CM	
V2	Mixer	6AQ5	6AQ5	7BD	
V3A	Oscillator	6J6	6J6	7BF	
B	Oscillator	6C4	6C4	6BG	
V4	1st Video IF	6AU6	6AU6	7BK	
V5	2nd Video IF	6AU6	6AU6	7BK	
V6	3rd Video IF	6AU6	6AU6	7BK	
V7	Video Det. -AGC Rectifier	6AL5	6AL5	6BT	
V8	Video Amp.	6AC7	6AC7	8N	
V9	DC Restorer-Sync. Sep. -Phase Inv.	12AU7	12AU7	9A	
V10	Sound IF Amp.	6AU6	6AU6	7BK	
V11	Ratio Det. -AF Amp.	6T8	6T8	9E	
V12	Audio Output	6AQ6	6AQ5	7BZ	
V13	Vert. Osc. -Vert. Amp.	6SN7GT	6SN7GT	8BD	
	Hor. Phase Det.	6AL5	6AL5	6BT	
V15	Hor. Multivib.	6SN7GT	6SN7GT	8BD	
V16	Hor. Output	6BG6G	6BG6G	5BT	
V17	Damper	6W4GT	6W4GT	4CG	
V18	HV Rectifier	1B3GT	1B3GT	3C	
V19	LV Rectifier	5U4G	5U4G	5T	
V20A	Picture Tube	12LP4	12LP4	12D	
B	Picture Tube	10BP4	10BP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TELE-KING PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	CEM-5	AFH888J	UP1CJ1098		TVL-304	▲ Filter
B	40	450						■ Filter
C	40	450						▲ Filter
C2	40	450	CET-4	E26D67	BR4045A		TVA-24	Output Decoupling
C3A	500	5	CEM-7	AFH100T10D	UP5015		EL-52	■ Bias Filter
B	50	150			BRH605		UT-501	▲ Decoupling
C4A	20	450	CEM-6	AFH422J2D	UP8DJ1112		EL-410†	▲ Decoupling
B	10	450					TVA-21	■ Vert. Output Decoupling
C	10	450						▲ Decoupling
D	10	450						V. Amp. Screen Bypass
C5	100	25	CET-5	PRS25/100	BRH251A		TVA-8	Vert. Output Cath. Bypass
C6	1	25	CET-6	E26E42	BR145		TVA-11	Stabilizing Cap.
C7	10			GP10M		NP0K-10		Fixed Trimmer
C8	10			GP10M		NP0K-10		Fixed Trimmer
C9	360			GP360M		GP2K-390		RF Coupling
C10	360			GP360M		GP2K-390		RF Cathode Bypass
C11	120			GP120M		GP2K-120		RF Decoupling
C12	360			GP360M		GP2K-390		RF Filament Bypass
C13	1							RF Coupling
C14	.47							RF Coupling
C15	22			GP22M		GP2K-22		RF Coupling
C16	1500			GP1500M		GP2L-0015		Mixer Decoupling
C17	1							Osc. Coupling
C18	4.7			SI4.7DN750		N750K-5		Osc. Feedback
C19	4.7			SI4.7DN750		N750K-5		Osc. Feedback
C20	360			GP360M		GP2K-390		Osc. Filament Bypass
C21	360			GP360M		GP2K-390		RF Bypass
C22	360			GP360M		GP2K-390		IF Coupling
C23	2000		CC-22	GP2000M	1W5D2	GP2M-002	29C2	Mixer Decoupling *
C24	2000		CC-22	GP2000M	1W5D2	GP2M-002	29C2	AGC Filter *
C25A	2000		CCD-22	GP2000M	1W5D2	GP2M-002	29C5	AGC Filter
B	2000			GP2000M	1W5D2	GP2M-002		1st V. IF Decoupling
C26	2000		CC-22	GP2000M	1W5D2	GP2M-002	29C2	1st V. IF Fil. Bypass
C27	100		CC-31	GP100M	5W5T1	GP1K-100	1FM-31	IF Coupling
C28	2000		CC-22	GP2000M	1W5D2	GP2M-002	29C2	AGC Filter *
C29A	2000		CCD-22	GP2000M	1W5D2	GP2M-002	29C5	2nd V. IF Decoupling
B	2000			GP2000M	1W5D2	GP2M-002		2nd V. IF Fil. Bypass
C30	100		CC-31	GP100M	5W5T1	GP1K-100	29C2	IF Coupling
C31A	2000		CCD-22	GP2000M	1W5D2	GP2M-002	29C5	3rd V. IF Cath. Bypass
B	2000			GP2000M	1W5D2	GP2M-002		3rd V. IF Decoupling
C32	2000		CC-22	GP2000M	1W5D2	GP2M-002	29C2	3rd V. IF Fil. Bypass
C33	.1	600	CP-4-01	P688-1	PTE5P1		TM-1	AGC Filter
C34	100		CC-31	GP100M	5W5T1	GP1K-100	1FM-31	IF Coupling
C35	120		CC-312	GP120M	5W5T15	GP2K-120	1FM-315	IF Coupling
C36	2000		CC-22	GP2000M	1W5D2	GP2M-002	29C2	RF Bypass
C37	.01	400	CP-4-11	P488-01	PTE4SI	82I-01	TM-11	DAGC Decoupling
C38	.1	600	CP-4-01	P688-1	PTE5P1		TM-1	Bias Filter
C39	2000		CC-22	GP2000M	1W5D2	GP2M-002	29C2	Bias Filter
C40	5		CC-55	GP5M	5W5V5	NP0K-5	MS-55	V. Diode Filter
C41	2000		CC-22	GP2000M	1W5D2	GP2M-002	29C2	V. Det. -AGC Fil. Bypass
C42	680		CC-368	GP680M	1W5T7	GP2K-680	1FM-375	V. Amp. Cath. Bypass
C43	470		CC-247	GP470M	5W5T5	GP2K-470	1FM-35	V. Amp. Cath. Bypass
C44	.1	600	CP-4-01	P688-1	PTE4P1		TM-1	Video Coupling
C45	39		CC-439	GP39M	5W5Q4	GP1K-39	1FM-44	S. IF Coupling
C46	.02	400	CP-4-12	P488-02	PTE4S2		TM-12	S. IF Decoupling
C47	.005	600	CP-4-25	P688-005	PTE6D5	81I-005	TM-25	S. IF Screen Bypass
C48	.02	400	CP-4-12	P488-02	PTE4S2		TM-12	S. IF Decoupling
C49	.001	600	CP-4-21	P688-001	PTE6D1	GP2L-001	TM-21	Diode Load Cap.
C50	.002	600	CP-4-22	P688-002	PTE6D2	GP2M-002	TM-22	De-emphasis
C51	.005	600	CP-4-25	P688-005	PTE6D5	81I-005	TM-25	Audio Coupling
C52	.005	600	CP-4-25	P688-005	PTE6D5	81I-005	TM-25	Audio Coupling
C53	.02	400	CP-4-12	P488-02	PTE4S2		TM-12	Audio Coupling
C54	.05	400	CP-4-15	P488-05	PTE4S5		TM-15	Bias Filter

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TELE-KING PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C55	.005	600	CP-4-25	P688-005	PTE6D5	81I-005	TM-25	Output Plate Bypass
C56	22	500	CM-4-22	GP22M	5W5Q25	GP1K-22	MS-425	Sync. Clipper Plate Bypass
C57	.01	600	CP-4-11	P688-01	PTE6SI	82I-01	TM-11	Sync. Coupling
C58	.002	600	CP-4-22	P688-002	PTE6D2	GP2M-002	TM-22	Integrator Net.
C59	.005	600	CP-4-25	P688-005	PTE6D5	81I-005	TM-25	Integrator Net.
C60	.005	600	CP-4-25	P688-005	PTE6D5	81I-005	TM-25	Integrator Net.
C61	.005	600	CP-4-25	P688-005	PTE6D5	81I-005	TM-25	Vert. Osc. Grid Cap.
C62	.1	600	CP-4-01	P688-1	PTE6P1		TM-1	Vert. Discharge
C63	.25	400	CP-4-025	P488-25	GT4P25		TC-2	Vert. Sweep Coupling
C64	.001	600	CP-4-21	P688-001	PTE6D1	GP2L-001	TM-21	Hor. Sync. Coupling
C65	.001	600	CP-4-21	P688-001	PTE6D1	GP2L-001	TM-21	Hor. Sync. Coupling
C66	.05	400	CP-4-15	P488-05	PTE4S5		TM-15	Hor. Feedback
C67	.01	400	CP-4-11	P488-01	PTE4SI	82I-01	TM-11	AFC Filter
C68	.005	600	CP-4-25	P688-005	PTE6D5	81I-005	TM-25	AFC Filter
C69	.05	400	CP-4-15	P488-05	PTE4S5		TM-15	AFC Filter
C70	3900	500	CM-339					Fixed Trimmer
C71	330	500	CM-333	GP330M	5W5T3	GP2K-330	1FM-335	Hor. MV Feedback
C72	390	500	CM-339	GP390M	5W5T4	GP2K-390	1FM-34	Hor. Discharge
C73	270	500	CM-327	GP270M	5W5T25	GP2K-270	1FM-325	Hor. Sweep Coupling
C74	22	500		GP22M	5W5Q25	GP1K-22	MS-425	Hor. Feedback †
C75	22	500		GP22M	5W5Q25	GP1K-22	MS-425	Hor. Feedback †
C76	.05	600	CP-8-15	P688-05	PTE6S5		TM-15	Hor. Output Screen Bypass
C77	.25	400	CP-4-025	P488-25	GT4P25		TC-2	Hor. Output Cath. Bypass
C78	.1	600	CO-6-01	P688-1	PTE6P1		TM-1	Damper Filter
C79	.035	600	CO-6-135	P688-033				Damper Filter
C80	.001	600		P688-001	PTE6D1	GP2L-001	TM-21	Damper Filter *
C81	.001	600		P688-001	PTE6D1	GP2L-001	TM-21	Damper Filter *
C82	.25	400	CP-4-025	P488-25	GT4P25		TC-2	Hor. Sweep Coupling
C83	500	10000	CHV-35					HV Filter
C84	.1	600	CP-4-01	P688-1	PTE6P1		TM-1	Pic. Tube Cath. Dec.
C85	.1	600	CP-4-01	P688-1	PTE6P1		TM-1	Line Filter *

* Not used in all models.
† Some models use 12MMF 1500 volt rating in place of items C74 and C75, MFGR'S part No. CM-412.
‡ Parallel sections to obtain desired capacity.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TELE-KING PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	INSTALLATION NOTES
R1A	500KΩ	½	P-7	Q13-133	M-60-Z	Volume control
B	Switch		Not Req.	76-1	SW-A	Attach to R1A per instructions
R2A	1 Meg.	½	PD-5	B11-137 §	PD-5	Vert. hold control-panel
B	50KΩ	½		B11-123 §		Horiz. hold control, rear
C	Shaft End			E187 §		Attach per instructions in "Concentrikit".
R3A	750Ω	2	PD-4		PD-4	Contrast control, tapped at 500Ω, Wire Wound
B	100KΩ	½				Brightness control
R4	3000Ω	1				Vert. linearity control-Wire Wound-See note 1
R5	2.5Meg.	½	P-5	Q11-239	M-84-S	Height control
R6	1500Ω	3	P-6		10-1500	Focus control-Wire Wound

§ Additional parts to be used with "Concentrikit".
Note 1. Some models use 5000Ω control, part No. P-2 in this application.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TELE-KING PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R7	1 Meg. 20%	½			RF Grid
R8	100Ω 5%	½			RF Cathode
R9	1000Ω 20%	½		BTS-1000	RF Decoupling
R10	4700Ω 5%	½			RF Coil Shunt
R11	4700Ω 5%	½			Mixer Coil Shunt
R12	1 Meg. 20%	½			Mixer Grid
R13	1000Ω 5%	½		BTS-1000-5%	Mixer Decoupling
R14	100KΩ	½			Osc. Grid
R15	100KΩ	½			Osc. Grid
R16	47Ω 20%	½			Osc. Cathode
R17	1000Ω 20%	1		BTS-1000	Osc. Plate
R18	330Ω	½	RC-331-2		AGC Network See Note 2
R19	330Ω	½	RC-331-2		AGC Network
R20	100Ω	½	RC-101-2		Decoupling
R21	10KΩ	½	RC-103-2		1st Video IF Grid
R22	82Ω	½	RC-820-2		1st Video IF Cathode
R23	100Ω	½	RC-102-2		1st Video IF Decoupling
R24	8200Ω	½	RC-822-2		2nd Video IF Grid
R25	82Ω	½	RC-820-2		2nd Video IF Cathode
R26	100Ω	½	RC-101-2		2nd Video IF Decoupling
R27	8200Ω	½	RC-822-2		3rd Video IF Grid Coil Shunt
R28	82Ω	½	RC-820-2		3rd Video IF Cathode
R29	100Ω	½	RC-101-2		3rd Video IF Decoupling
R30	1 Meg.	½	RC-105-2	BTS-1 Meg.	AGC Network
R31	680KΩ	½	RC-684-3	BTS-680K	AGC Rect. Diode Load
R32	39KΩ	1	RC-393-5	BTA-39K	Voltage Divider
R33	1000Ω 20%	½	RC-102-2	BTS-1000	Bias Network
R34	8200Ω	½	RC-822-2	BTS-8200	Video Det. Diode Load
R35	120Ω	½	RC-121-2		Parasitic Supp.
R36	54KΩ	2	RC-543-8		Video Amp. Plate
R37	54KΩ	2	RC-543-8		Video Amp. Plate
R38	44KΩ	2	RC-443-8		Video Amp. Screen
R39	44KΩ	2	RC-443-8		Video Amp. Screen
R40	22KΩ	1	RC-223-5	BTA-22K	Voltage Divider
R41	5600Ω	1	RC-562-5	BTA-5600	Voltage Divider

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TELE-KING PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R43	2200Ω	½	RC-222-2	BTS-2200	Picture Tube Grid
R43	270KΩ	½	RC-274-2	BTS-270K	DC Rest. Load
R44	47KΩ	½	RC-473-2	BTS-47K	Voltage Divider
R45	820KΩ	½	RC-824-2	BTS-820K	Voltage Divider
R46	1 Meg.	½	RC-105-2	BTS-1 Meg.	Sync. Phase Inv. Grid
R47	3900Ω	½	RC-392-2	BTS-3900	Sync. Phase Inv. Cathode
R48	3900Ω	½	RC-392-2	BTS-3900	Sync. Phase Inv. Plate
R49	3900Ω	½	RC-392-2	BTS-3900	Sync. Phase Inv. Plate
R50	22KΩ	½	RC-223-2	BTS-22K	Integrator
R51	220KΩ	½	RC-224-2	BTS-220K	Voltage Divider
R52	18KΩ	½	RC-183-2	BTS-18K	Voltage Divider See Note 3
R53	470KΩ	½	RC-474-2		Sound IF Grid
R54	1000Ω 20%	½	RC-102-2	BTS-1000	Sound IF Cathode
R55	82KΩ	½	RC-823-2	BTS-82K	Voltage Divider
R56	100KΩ	½	RC-104-2		Sound IF Screen
R57	1000Ω 20%	½	RC-102-2	BTS-1000	Sound IF Decoupling
R58	44KΩ	½	RC-443-2		Ratio Det. Diode Load
R59	15KΩ	½	RC-153-2	BTS-15K	De-emphasis
R60	470KΩ	½	RC-474-2	BTS-470K	AF Grid
R61	330KΩ	½	RC-334-2	BTS-330K	AF Plate
R62	100KΩ	½	RC-104-2	BTS-100K	Output Grid
R63	330KΩ 5%	½	RC-334-3	BTS-330K-5%	Voltage Divider
R64	180KΩ 5%	½	RC-184-3	BTS-180K-5%	Voltage Divider
R65	4700Ω	½	RC-472-2	BTS-4700	Voltage Divider
R66	470KΩ	½	RC-474-2	BTS-470K	Voltage Divider
R67	390Ω	1	RC-391-5	BW-1-390	Filter
R68	1200Ω	2	RC-122-8	BT-2-18K	Focus Coil Shunt See Note 2
R69	8200Ω	½	RC-822-2	BTS-8200	Integrator
R70	8200Ω	½	RC-822-2	BTS-8200	Integrator
R71	1 Meg.	½	RC-105-2	BTS-1 Meg.	Vert. Osc. Grid
R72	6.8 Meg.	½	RC-685-2	BTS-6.8 Meg.	Voltage Divider
R73	100KΩ	½	RC-104-2	BTS-100K	Voltage Divider
R74	820KΩ	½	RC-824-2	BTS-820K	Vert. Osc. Plate See Note 4
R75	2.2 Meg.	½	RC-225-2	BTS-2.2 Meg.	Vert. Amp. Grid
R76	330Ω	½	RC-331-2	BW-½-330	Vert. Amp. Cathode
R77	6800Ω	½	RC-682-2	BTS-6800	Vert. Peaking
R78	8000Ω	1	RC-682-5	BTA-6800	Vert. Amp. Plate Decoupling
R79	100KΩ	½	RC-104-2	BTS-100K	Horiz. Phase Det. Load
R80	100KΩ	½	RC-104-2	BTS-100K	Horiz. Phase Det. Load
R81	4.7 Meg.	½	RC-475-2	BTS-4.7 Meg.	Horiz. Phase Det. Load
R82	470KΩ	½	RC-474-2	BTS-470K	Horiz. AFC Filter Network
R83	27KΩ	½	RC-273-2	BTS-27K	Feedback Network
R84	5600Ω	½	RC-562-2	BTS-5600	Horiz. MV Plate
R85	1500Ω	½	RC-152-2	BTS-1500	Horiz. MV Cathode
R86	68KΩ	½	RC-683-2	BTS-68K	Horiz. MV Grid
R87	270KΩ	½	RC-274-2	BTS-270K	Horiz. MV Plate
R88	22KΩ	1	RC-223-5	BTA-22K	Filter
R89	22KΩ	1	RC-223-5	BTA-22K	Filter
R90	68Ω	½	RC-680-2		Parasitic Supp.
R91	1 Meg.	½	RC-105-2	BTS-1 Meg.	Horiz. Output Grid
R92	82Ω	1	RC-820-5	BW-1-82	Horiz. Output Cathode
R93	8200Ω	2	RC-822-8	BT-2-8200	Horiz. Output Screen
R94	4700Ω	½	RC-472-2	BTS-4700	Feedback
R95	6300Ω	50	RC-632-17		Damper Filter, tapped at 5800Ω and 5300Ω -Wire Wound
R96	3.3Ω	½	RC-336-2		HV Rect. Filament
R97	1 Meg.	1	RC-105-5		HV Filter
R98	15Ω	1	RC-150-5	BW-1-15	Bias Network

Note 2. Not used in all models.
Note 3. Some models use 10KΩ resistor in this application.
Note 4. Some models use 1.5 Meg. resistor in this application.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: TELE-KING PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.				
SP1A	PM	3.6Ω	①		46A15	① Used in models 410 and 512.
B	PM		②	ST-117 MOD. P8-T	8A31	② Used in model 710.
C	PM		③	ST-119 ④ MOD. P10-T	10A31	③ Used in model 612. ④ Replace output transformer to match 6-8Ω voice coil.
	CONE DIA.	V. C. DIA.				
SP2A	3 7/8" x 5 7/8"	9/16"	①			
B	8"		②			
C	10"		③			

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: TELE-KING PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC at 1.62A	780VCT .142ADC	5VAC at 3A	6.3VAC at 6A SEC. 4 6.3VAC 2.4A	T-108	P-8154 and P-5014 ⑦	P-3067	

⑦ Mount filament transformer below chassis.

TELE KING
MODELS 410, 512, 612, 710

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	DC RESISTANCE		TELE-KING PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.					
T2	170Ω	1130Ω	T-104	A-8111 ⑤	A-3000 ⑤	TBO-1 ⑤	Vert. Block Osc. Trans.
T3	320Ω	SEC. 1	T-211T3	A-8127	HVO-3	TFB-2	Hor. Output Trans.
	Tap at 165Ω	10.6Ω Tap at .6Ω					
T4	1120Ω	8.5Ω	T-107	A-8112	A-3035 ⑥	TSO-5	Vert. Output Trans.
T5A	13Ω		DY-2	DY-1	MD-1		Hor. Deflection Coil
B	59Ω						Vert. Deflection Coil
T6	240Ω		LF-3	FC-10	MF-1		Focus Coil

⑤ Drill one new mounting hole.
⑥ Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		TELE-KING PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T7	5.6KΩ	3.6Ω	420Ω	.7Ω	T-102	A-3877	A-2930	RO-9 ⑤	⑤Drill one new mounting hole.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	TELE-KING PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.142A	32Ω	.8 Henry	LC-3	C-2325 ⑤	C-2991 ⑤	TR-4200⑤	⑤Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	TELE-KING PART No.	MEISSNER PART No.	
L2	Wave Trap	0Ω				Part of tuner.
L3	Wave Trap	0Ω				Part of tuner.
L4	Ant. Input	.2Ω CT				Part of tuner.
L5	RF End. Ind.	0Ω				Part of tuner.
L6	RF End. Ind.	0Ω				Part of tuner.
L7	Osc. Coil	0Ω				Part of tuner.
L8	Mixer Plate	.2Ω				Part of tuner. (Used in tuner TT-3 only).
L9	Mixer Plate			LV-6		Used with tuner TT-1 only.
L10	Fil. Choke	0Ω		LC-1		
L11	2nd Video IF	.1Ω		LTO-2		
L12	Fil. Choke	0Ω		LC-1		
L13	Plate Choke	5Ω		LC-4		
L14	3rd Video IF	.1Ω		LV-6		
L15	Fil. Choke	0Ω		LC-1		
L16	Plate Choke	5Ω		LC-4		
L17	4th Video IF	.1Ω		LV-6		
L18	Peaking	6Ω		LP-5		
L19	Peaking	10Ω		LP-6		
L20	Peaking	7.5Ω		LP-7		Wound on 18KΩ resistor.
L21	Peaking	10Ω		LP-8		
L22	Sound IF	2Ω	2Ω	LTO-3		
L23	Ratio Det. Trans.	6Ω	.5Ω	LRD-1		
L24	Horiz. AFC	95Ω		LHO-2		
L25	Width Cont.	.2Ω		L-201R1		
L26	Horiz. Linearity	34Ω		L-201R3		

MISCELLANEOUS

ITEM No.	PART NAME	TELE-KING PART No.	NOTES
M1A	RF Tuner	TT-1	Complete except tubes.
B	RF Tuner	TT-3	Complete except tubes.
M2	Fuse		Type GJV, .25A
M3	Ion Trap	IT-1	

WEBSTER
MODEL 256

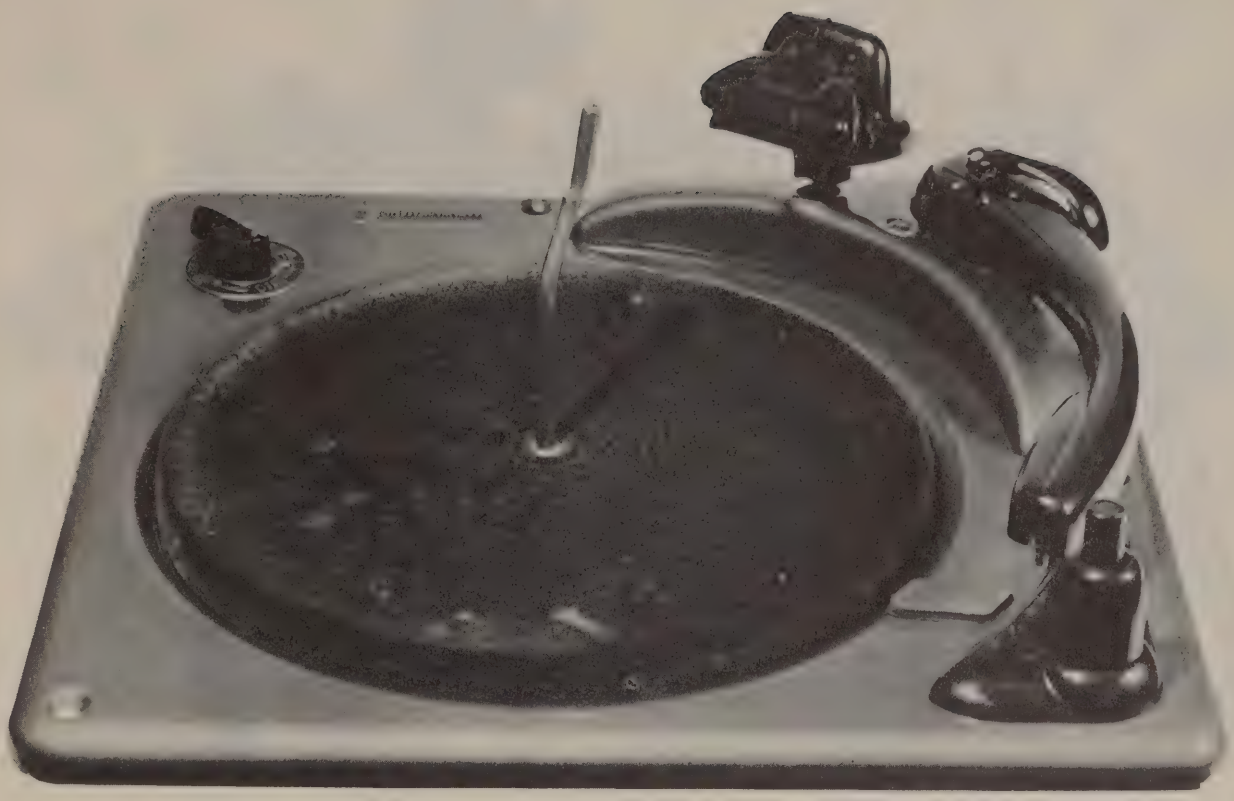


FIGURE 1

WEBSTER
MODEL 256

GENERAL INFORMATION

The Webster Model 256 is a single-post changer designed to play automatically up to twelve 10-inch or ten 12-inch records not intermixed, 78 RPM, or the new long-play 33⅓ RPM records. The pickup arm will return to a rest position upon completion of the last record. The turntable will continue rotating until the mechanism is turned off by the control knob. Manual operation is provided for playing non-standard and home recordings. The idler wheels are automatically retracted when the changer is not operating.

TO REPLACE NEEDLE

The twin-type needle supplied with the cartridge may be removed, if desired, by loosening the needle screw located on the end of the cartridge. In replacing the needle, be sure the milled flat on the needle faces the needle set screw.

Manufactured by: **WEBSTER-CHICAGO • 5610 Bloomingdale Avenue, Chicago, Illinois**

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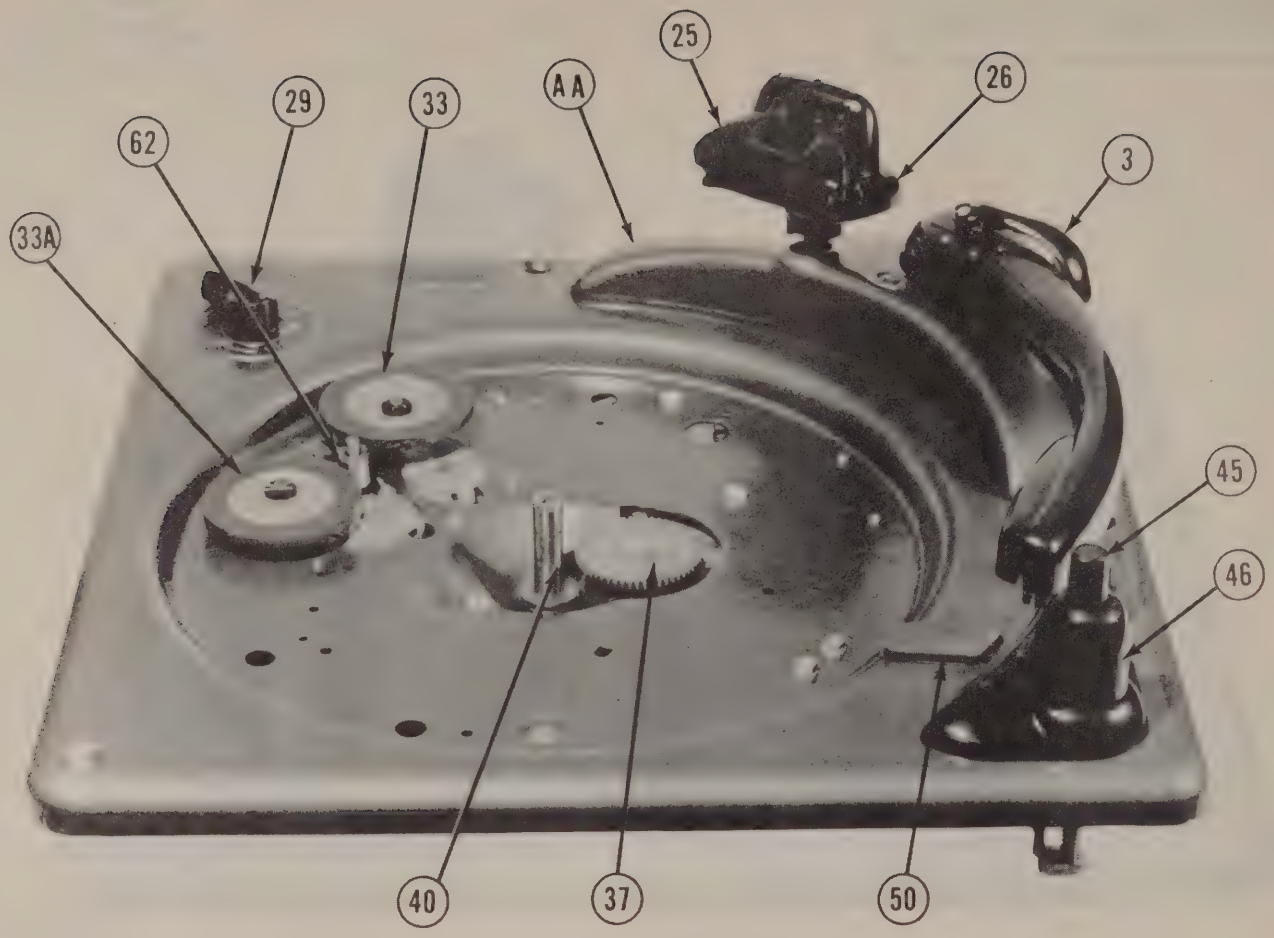

FIGURE 2

OPERATING INSTRUCTIONS

1. *Loading the Changer:*

(a) Set the record shelf (26) for the size records to be played.

(b) Place the record stabilizer weight (25) in a position away from the spindle.

(c) Place a stack of records on the spindle (23) and ledge of the record shelf (26).

(d) Lower the record stabilizer weight (25) to the record, being careful not to let it snap onto the records.

2. *Operating Changer for New Long-Play, 33⅓ R.P.M. Records:*

(a) After the long-play records have been loaded on the changer, as described in the paragraph on "Loading the Changer," swing the balance weight (3) around to the back of the pickup arm. This pivots the cartridge so that the long-play needle will engage the record; this also compensates for weight difference of the pickup arm.

(b) Turn the Manual-Automatic control knob (46) to "Automatic."

(c) Turn the control knob (29) to the position marked "33⅓," which is stamped on the escutcheon. This starts the motor rotating and pivots the idler wheel (33) against the motor shaft.

(d) Press down on the reject button (45). The changer will now play, automatically, the entire stack of records, and upon completion of the last record, the arm will return to a rest position on the arm rest. To stop the changer turn the control knob (29) to the "Off" position.

3. *Operating the Changer for Standard 78 R.P.M. Records:*

(a) Load the changer with standard 78 R.P.M. records.

(b) Place the balance weight (3) alongside the pickup arm.

(c) Turn the Automatic-Manual control knob to the "Automatic" position.

(d) Turn the control knob (29) to the position marked "78." The changer will now play the entire stack of records, and upon completion of the last record, the arm will return to a rest position on the rest post. To stop the changer turn the control knob (29) to the "Off" position.

4. *Manual Operation:*

(a) Rotate the record shelf and post (26) to the 12-inch position *(this is for clearance only).*

(b) Flip the stabilizer away from the spindle.

(c) Place the record on the turntable.

(d) Turn the "Manual-Automatic" control knob (46) to the "Manual" position.

(e) In playing the new long-play, 33⅓ R.P.M. records, swing the balance weight (3) to the back of the pickup arm so the red dot is facing the spindle, and turn the control knob (29) to the position marked "33⅓."

(f) For standard 78 R.P.M. records, the balance weight should be pivoted to the side of the pickup arm so as to present the white dot to the spindle; then turn the control knob (29) to the position marked "78."

(g) Place the pickup arm on the record.

(h) Upon completion of the record, place the pickup arm on the rest post and turn the control knob (29) to the "Off" position.

(i) Remove the record.

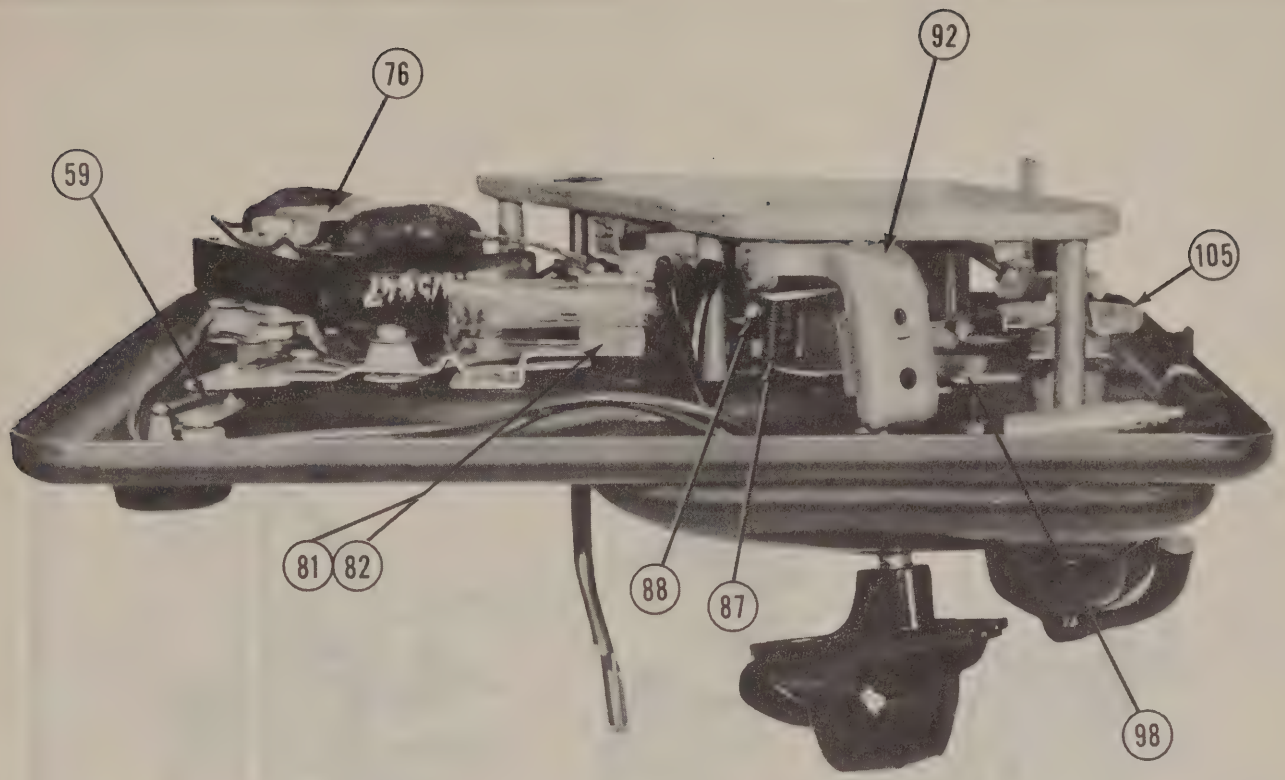

FIGURE 3

THE CHANGE CYCLE

The trip dog (86) is normally held away from the cam actuating gear (77) by the velocity trip and roller assembly (78). This assembly may be moved away manually by pressing on the reject button (45), or it will be moved away automatically when the pickup arm approaches the spindle at a rate greater than ⅛" per half revolution of the turntable. During normal playing of a record, the automatic trip arm (102) pushes against the velocity trip assembly, but the projection on the cam actuating gear (77) pushes it back with each half revolution of the turntable so that with normal groove pitch, the trip dog (86) will not be released.

When the trip dog is released by the fast lead-in of the tone arm, the dog falls into one of the ratchet teeth in the under surface of the cam actuating gear (77). This engages the cam with the gear, causing the cam to turn. As soon as the cam begins to rotate, the roller on the rocker arm (92) rides out of the detent on to the flat surface of its track. This causes the record selector post (26) to move forward about 3/32". This movement is not sufficient to drop a record; its purpose is to catch the automatic arm rest lever (98) to prevent the lever (98) from engaging the raising disc and setting the arm down on the arm rest before the last record has been played. At the same time, the stud on the pickup raising lever (99) moves out, bringing the raising lever into position to catch the small notch in the pickup raising disc (105).

As the cam continues to turn, the pickup arm raising lever pushes up on the disc, raising the pickup arm off the record. The stud on the pickup raising lever now moves toward the center of the cam, moving the pickup out clear of the record stack.

As the cam continues to rotate, the roller on the rocker arm moves down the incline, moving the record selector post forward and dropping a record to the turntable. The stud on the raising lever now moves back away from the center of the cam, moving the pickup arm in to the set-down position. This position is determined by the compression spring (96). When the record selector post is turned to the 10-inch position, pressure is applied through this spring to cause the raising lever stud to follow the outer edge of the groove in the main cam. With the record selector post in the 12-inch position, the spring is relaxed and the stud follows the inner edge of the groove.

The stud of the raising lever (99) now moves up an incline, allowing the pickup arm to set down on the record. At the same time, the roller on the rocker arm (92) moves back up its incline, allowing the record selector post to move back to its normal position.

The hook on the velocity trip and roller assembly (78) catches the trip dog (86) and disengages the main cam from the cam actuating gear at the end of the cycle. If no record is resting on the spindle step at the beginning of a change cycle, the automatic arm rest lever (98) will engage the pickup raising disc (105), which prevents the pickup from moving in to the set-down position. It, therefore, sets down on the rest post.

ADJUSTMENTS

Pickup Arm Height:

The vertical movement of the pickup arm is controlled by the angle of the pickup arm raising lever (99).
To make the adjustment:

1. Place a full stack of 10" records on the turntable.

A PHOTOFACT "EXPLODED" VIEW

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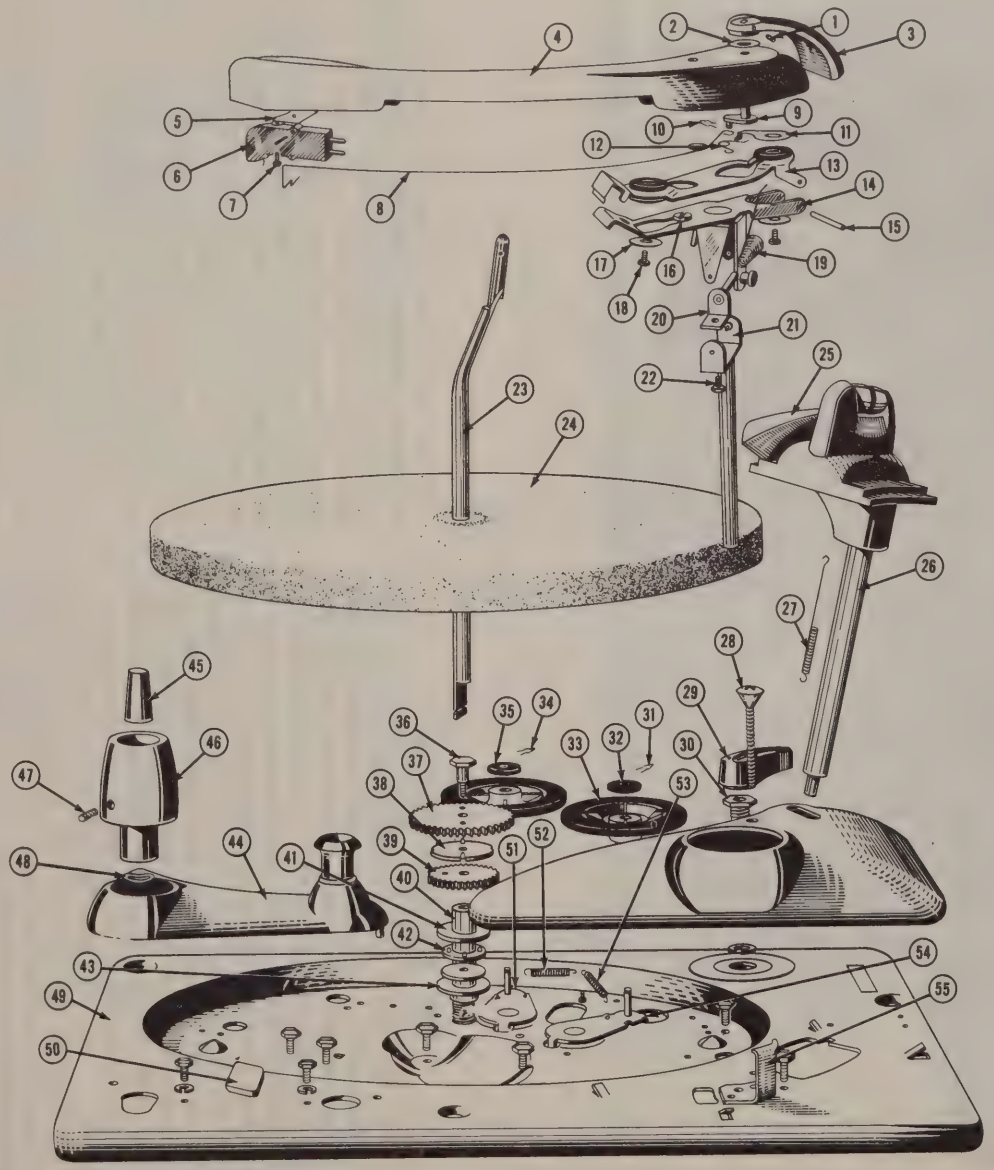

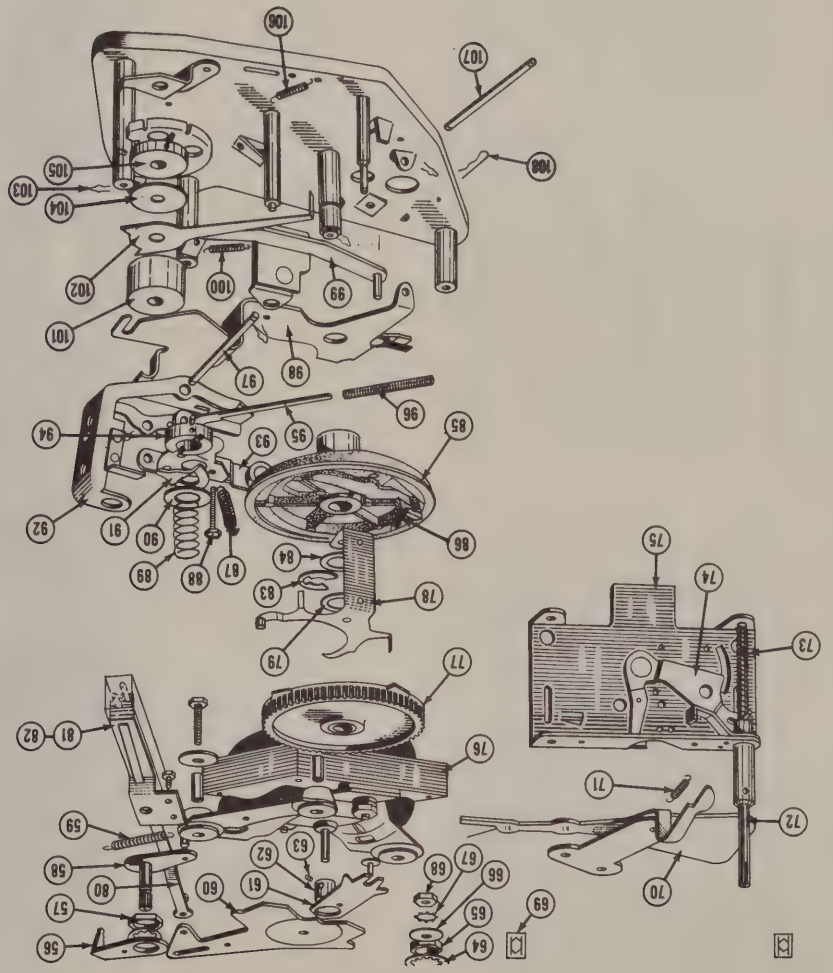
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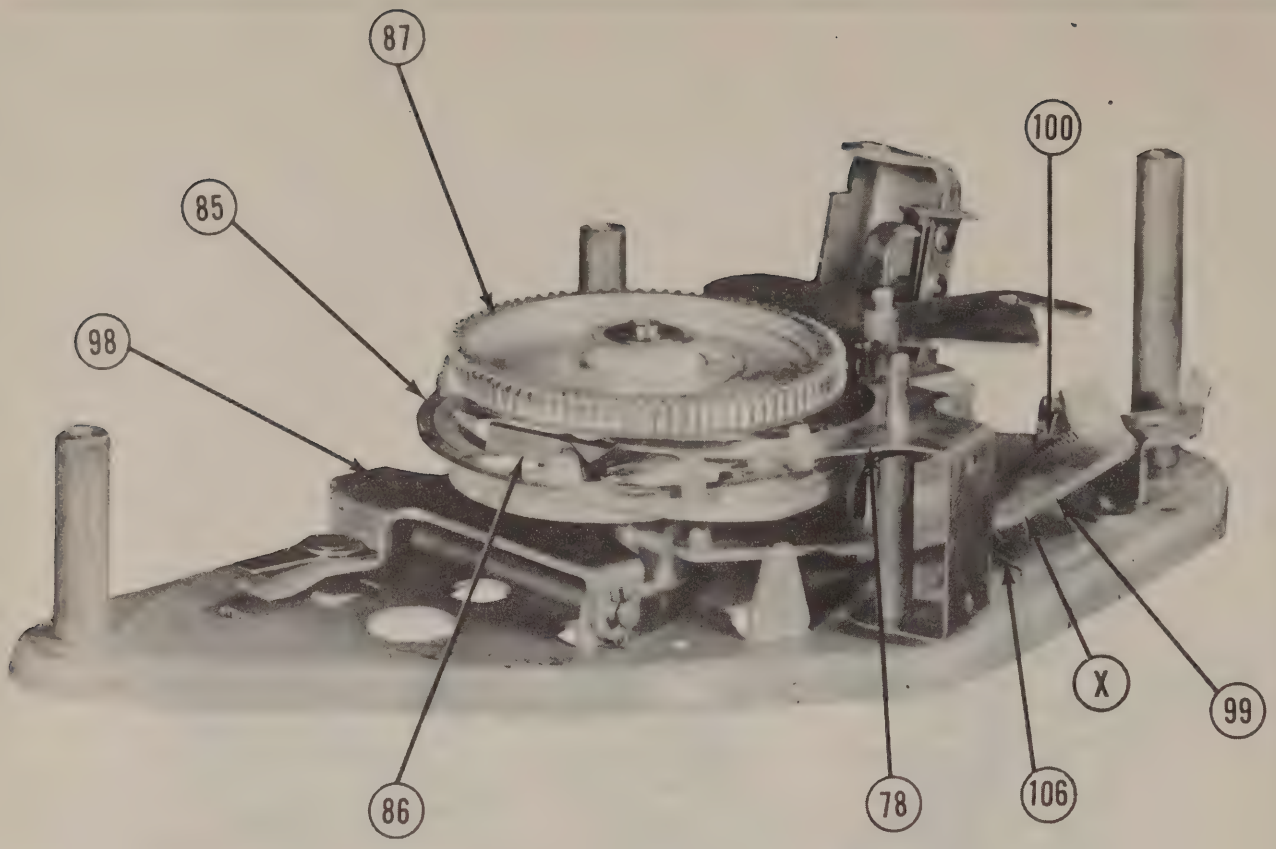


FIGURE 4

2. Swing the balance weight (3) around to the side of the arm. This pivots the cartridge for 78 R.P.M. operation which places the cartridge to its lowest position.

3. Push down on the reject button (45) and release it.

4. Rotate the turntable by hand until the pickup arm and needle approach the stack of records.

5. Be sure that the raising lever (99) engages the notch in the raising disc (105).

6. If the clearance between the needle and the top record is not approximately 1/16", adjust by bending the raising lever (99) at point (X) in figure 4.

Caution: Bend slowly as only a slight change in angle is required.

Set-Down Adjustment:

Normally, the set-down point may be adjusted by turning the eccentric screw (16) in the hinge. This screw may be reached through a hole in the top of the pickup arm. If this screw does not move the arm far enough, loosen the set screws in the pickup arm raising disc, and turn the disc until the adjustment is correct. Use a standard 10-inch record and adjust for a set-down point ⅛" in from the edge of the record. Check the adjustment with a standard 12" record and make a compromise adjustment if necessary.

Record Selector Post Angle:

The record selector post should be adjusted so that the curve of the post lines up with the edge of a record on the spindle. This may be adjusted, if necessary, by loosening the set screws in the selector lever collar (94) and turning the post to the proper angle.

Automatic Trip Clutch Friction:

The clutch collar (101) supplies enough weight (friction) to operate the trip mechanism. No oil or grease should be used on the clutch mechanism as this may prevent the clutch mechanism from operating properly.

Velocity Trip and Roller Assembly:

The hook which disengages the trip dog (86) from the main cam actuating gear should be adjusted for a clearance of five to fifteen mils below the actuating gear. Too much clearance may allow the trip dog to bounce and re-engage.

Record Selector Post Distance:

At the beginning of the change cycle, the record selector post moves about 3/32" toward the spindle. The purpose of this movement is to lock the automatic arm rest lever so it will not interfere with the set-down on the last record. The movement should not be enough to drop a record. If a record does drop during this movement, it will fall on the pickup arm. Early dropping will usually be caused by the selector post resting too far from the spindle. This allows the record to catch on the edge of the selector post instead of sliding on the ledge, and the initial movement of the post will drop the record.

To properly adjust the rocker arm, rotate the screw (88) clockwise to move the record shelf toward the spindle, and counterclockwise to move the shelf away from the spindle. This screw is made accessible by removing the turntable and adjusting through hole (AA) in the base plate, Fig. 2.

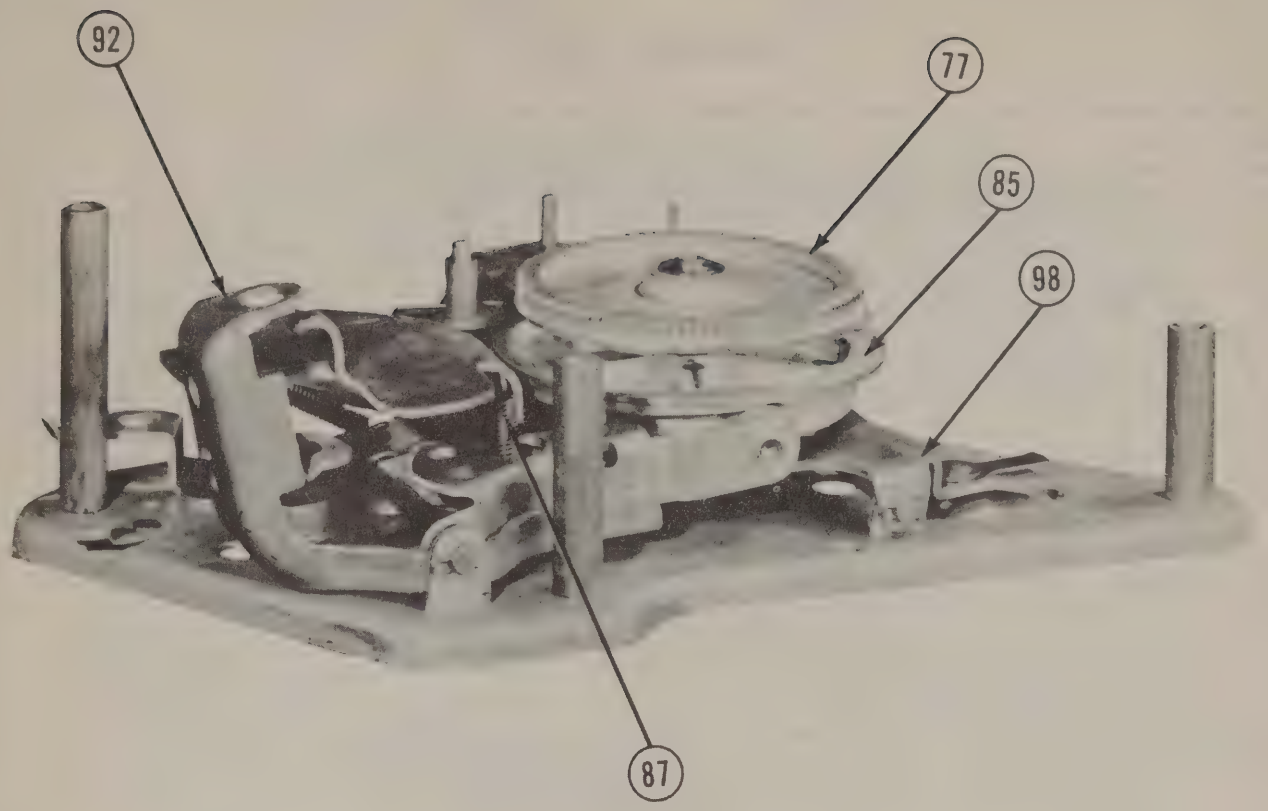


FIGURE 5

TROUBLES

Failure to Trip:

(e) Manual trip lever (70) binding.
(b) Binding in velocity trip and roller assembly (78).
(c) Trip dog (86) binding.
(d) Automatic trip arm (102) bent.
(e) Manual trip lever (70) binding.
(f) No lead-in groove on record.

Failure of Manual Trip:

(a) Hair spring on trip lever (70) bent or broken.
(b) Trip dog (86) binding.
(c) Velocity trip and roller assembly binding.

Continues Tripping:

(a) Too much clearance on hook (78).
(b) Hook bent and not engaging trip dog.
(c) Roller on velocity trip assembly broken.
(d) Manual trip lever binding.

Pickup Arm Fails to Set Down on Rest Post After Last Record:

(a) Spindle binding.
(b) Hook on automatic arm rest lever fails to engage the raising disc.

Motor Fails to Shut Off:

(a) Check switch (81).

Spindle Drops More Than One Record:

(a) Exceptionally thin records.
(b) Spindle latch sticking. Clean with carbon tetrachloride.

Causes of "WOW":

(a) Warped records.
(b) Grease or oil on the turntable or idler wheels. Clean with carbon tetrachloride.

Irregular Speed in Playing 78 R.P.M. Records:

(a) Oil or grease on the turntable rim.
(b) Pulley (62) loose on the motor shaft.
(c) Idler bracket spring loose.

Turntable Fails to Rotate in 33⅓ R.P.M. Position:

(a) Idler bracket spring loose.

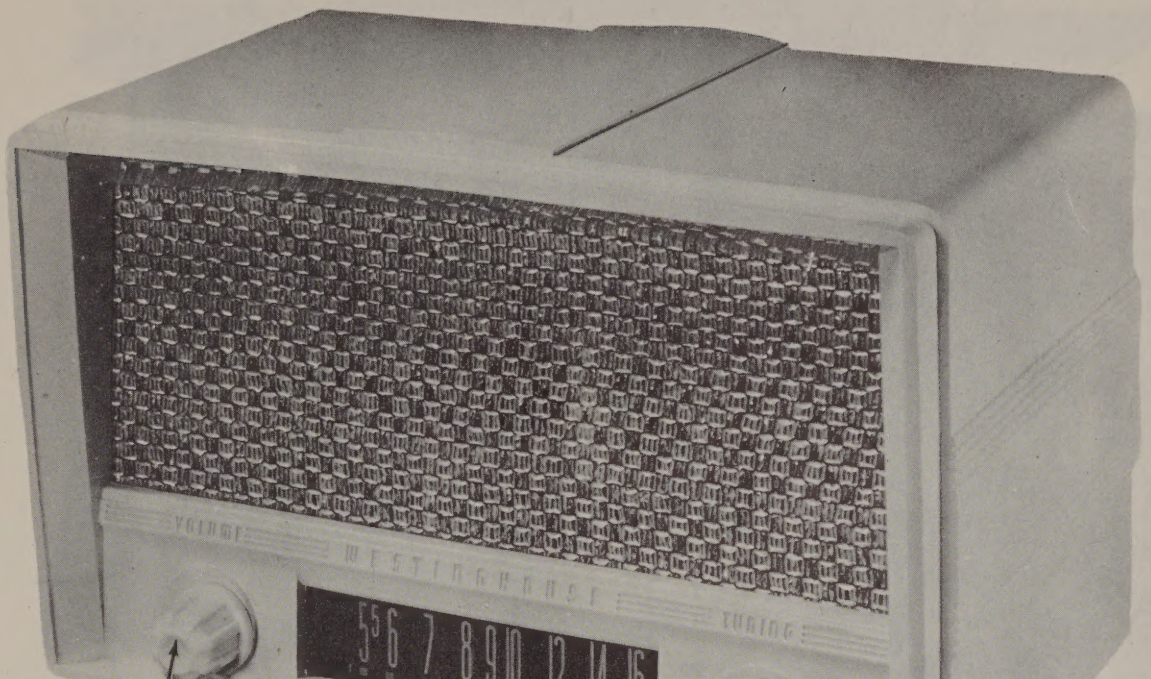
Cartridge Fails to Pivot When Actuated by the Balance Weight:

(a) Wire spring out of engagement with the cartridge.
(b) Balance weight (3) loose on pivot crank (9).

PARTS LIST

Ref. No.	Part No.	DESCRIPTION
1		Set screw
2		Fiber washer
3	11X429	Counter weight lever and set screw
4	49X068	Pickup arm less cartridge and hardware
5		Cartridge mounting bracket
6		Pickup cartridge
7	26P474	Pickup mounting screws
8	46P180	Cartridge tilt spring
9	11X405	Cartridge pivot crank
10	50P125	Hairpin clip
11	45P700	Crank lever spring retainer
12	46P176	Crank lever spring
13-14	21X283	Pickup arm mounting hinge
15		Pivot pin
16		Pickup arm set-down adjusting pin
17		Washer
18		Hinge mounting screw
19-20	11X386	Pickup counter balance assembly
21	11X385	Pickup shaft assembly
22		Mounting screw—pickup shaft assembly
23	11X133	Spindle
24	11X289	Turntable
25	49P074	Record stabilizer weight
26	49X029	Record selector post
27	46P126	Stabilizer weight spring
28		Crescent mounting screw
29	39P044	Speed control and shut-off button
30	41P632	Control shaft bearing
31	50P125	Hairpin clip
32	25P030	Felt washer
33	11X368	Idler wheel 33⅓ R.P.M.
33A	11X366	Idler wheel 78 R.P.M.
34	50P125	Hairpin clip
35	25P030	Felt washer
36	41P333	Shoulder mounting screw
37	47P024	Fiber gear (large)
38	45P342	Gear coupling
39	47P023	Fiber gear (small)
40	41P414	Turntable bearing stud
41	25P269	Bearing washer
42	11X058	Bearing race
43	25P269	Flat washer
44	49P027	Control escutcheon
45	49P111	Reject button
46	11X139	Manual-automatic control knob and set screw
47		Set screw (part of 46)
48		Spring washer
49		Base plate
50	24P022	Needle pad
51	11X375	Idler wheel pivot bracket
52	46P179	Tension spring—78 R.P.M.
53	46P134	Tension spring—33⅓ R.P.M.
54	11X375	Idler wheel pivot bracket
55		Tone arm lift stop bracket
56	45P757	Bracket for tension spring
57	26P276	Hex nut
58	11X381	Speed control crank
59	46P175	Speed control crank spring
60	11X397	Idler siwtching arm
61	45P755	Idler release lever for shut-off purposes
62	17X450	Motor pulley
63		Set screw
64	25P333	Lock nut
65	26P687	Turntable stud mounting nut
66	25P367	Flat washer
67	25P222	Lock washer
68	26P046	Hex nut
69		Speed nut
70	11X158	Reject trip lever
71	46P117	Tension spring
72	41P444	Reject shaft
73	46P123	Compression spring
74	45P361	Reject arm
75	11X396	Mounting bracket assembly
76	15X097	Motor
77	11X032	Main cam actuating gear
78	11X320	Velocity trip and roller assembly
79	25P343	Washer
80		Switch arm (part of item 60)
81-82	32P052	Switch and bracket assembly
83	25P342	"C" clip
84	25P343	Flat washer
85	11X033	Main cam assembly
86		Main cam pawl (part of item 85)
87	46P017	Rocker arm tension spring
88		Rocker arm adjusting screw
89	46P012	Compression spring
90		Flat washer (part of item 94)
91		Selector lever stop (part of item 94)
92	11X142	Rocker arm
93	11X141	Roller and rocker assembly
94	11X049	Selector lever and collar assembly
95		Selector lever (part of 94)
96	46P011	Selector lever compression spring
97	41P421	Rocker arm pivot pin
98	11X079	Automatic arm rest lever
99	11X046	Pickup arm raising lever assembly (includes springs)
100	46P139	Raising lever tension spring
101	41P576	Velocity trip clutch weight
102	45P568	Velocity trip arm
103		Hairpin clip
104	23P009	Felt washer
105	11X227	Pickup arm raising disc
106	46P022	Bracket tension spring
107	41P443	Automatic rest lever pivot pin
108	50P204	Spindle retaining clip

WESTINGHOUSE
MODELS H300T5, H301T5 (Ch. V-2148)



WESTINGHOUSE
MODELS H300T5, H301T5 (Ch. V-2148)

WESTINGHOUSE MODEL H301T5

TRADE NAME	Westinghouse, Models H300T5, H301T5 (Ch. V-2148)
MANUFACTURER	Westinghouse Electric Corp., Receiver Div., Sunbury, Pa.
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types 12BE6 Converter, 12BA6 IF Amp., 12AT6 DET-AVC-AF, 50C5 Power Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC
RATING	.27 Amp. at 117 Volts AC
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap fully closed and set pointer to last reference mark at low frequency end of dial. Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to stator on rear section of tuning gang. Low side to B-.	455KC (400 ~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1400KC	1400KC	"	A5, A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

HOWARD W. SAMS & CO., INC. • Indianapolis 1, Indiana

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PARTS LIST AND DESCRIPTIONS

WESTINGHOUSE MODELS H301T5

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: WESTINGHOUSE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amp.	12BA6	12BA6	7BK	
V3	DET.-AVC-AF	12AT6	12AT6	7BT	
V4	Power Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: WESTINGHOUSE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	60	150	V-9413-1	PRSA1684D	EDL8415C		TA-315 *	Filter-Red
B	80	150		PRS25/25			TVA-6	Filter-Orange
C	20	25						Output Cath. Bypass-Yellow
C2	3			GP5M	5W5V5	NPOK-3	MS-55	Ant. Coupling Note
C3	.05	400	RCP10W4503M	P488-05	PTE4S5		TM-15	AVC Filter
C4	.02	400	RCP10W4203M	P488-02	PTE4S2		TM-12	Tone Compensation
C5	.01	400	RCP10W4103M	P488-01	PTE4S1	821-01	TM-11	Audio Coupling
C6	220		R5CC20ZY221M	GP220M	5W5T25	GP2K-220	1FM-325	AF Amp. Plate Bypass
C7	.02	400	RCP10W4203M	P488-02	PTE4S2		TM-12	Audio Coupling
C8	.01	400	RCP10W4103M	P488-01	PTE4S1	821-01	TM-11	Output Plate Bypass
C9	.15	200	RCP10W2154M	P288-15	GT4P2		72P53	Line Isolation
C10	.05	400	RCP10W4503M	P488-05	PTE4S5		TM-15	Line Filter

* Parallel sections to obtain desired capacity.
Note. Not used in all models.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: Westinghouse PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	500KΩ	½	V-6198-3	Q13-133X	T-78	Volume control, tapped at 100KΩ
B	Switch		Not Req.	76-1	SW-A	Attach to R1A per instructions

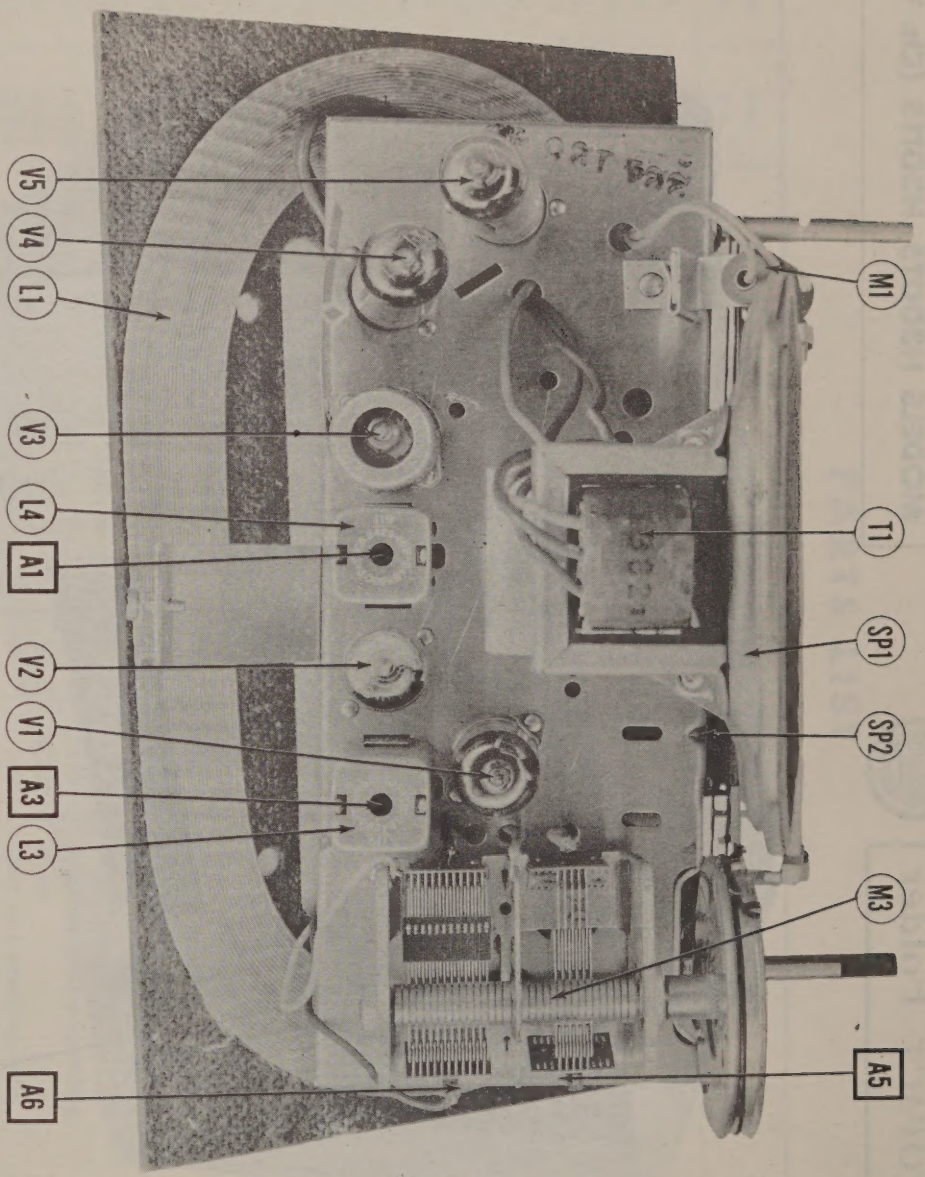
RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: WESTINGHOUSE PART No.	IRC PART No.	IDENTIFICATION CODES
R2	22KΩ	½	RC20AE223M	BTS-22K	Osc. Grid
R3	68Ω	½	RC20AE680K	BW-½-68	IF Cathode
R4	4.7 Meg.	½	RC20AE475M	BTS-4.7 Meg.	AVC Network
R5	10KΩ	½	RC20AE103M	BTS-10K	Tone Compensation
R6	10 Meg.	½	RC20AE106M	BTS-10 Meg.	AF Grid
R7	330KΩ	½	RC20AE334M	BTS-330K	AF Plate
R8	470KΩ	½	RC20AE474M	BTS-470K	Output Grid
R9	120Ω	½	RC20AE121M	BW-½-120	Output Cathode
R10	1200Ω	1	RC30AE122K	BW-1-1200	Filter
R11	220KΩ	½	RC20AE224M	BTS-220K	Isolation

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA: Westinghouse PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	2.4KΩ	3.4Ω	276Ω Tap at 26Ω	.7Ω	Part of V-9410	A-3330	A-3031	RO-3	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			WESTINGHOUSE PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V. C. IMP.		ST-105 *		
SP1	PM	3.4Ω	V-9410	MOD. P5-X	5A07 *	* Remount output transformer
	CONE DIA.	V. C. DIA.				
SP2	4 1/2"	9/16"				

R F COILS

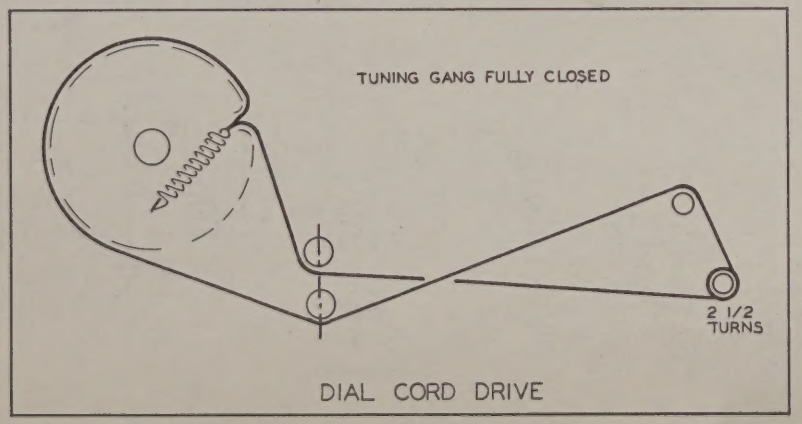
ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	Westinghouse PART No.	MEISSNER PART No.	
L1A	Loop Ant.	2Ω		V-9408-2		Model H301T5
B	Loop Ant.			V-9408-1		Model H300T5
L2	Osc. Coil	.8Ω	12Ω	V-5851	14-1073	
L3	Input IF	22Ω	22Ω	V-6199-2	16-6678	
L4	Output IF	22Ω	22Ω	V-6199-2	16-6678	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					WESTINGHOUSE PART No.		
M1	Bayonet	6-8	.15	Brown	47		Type #47

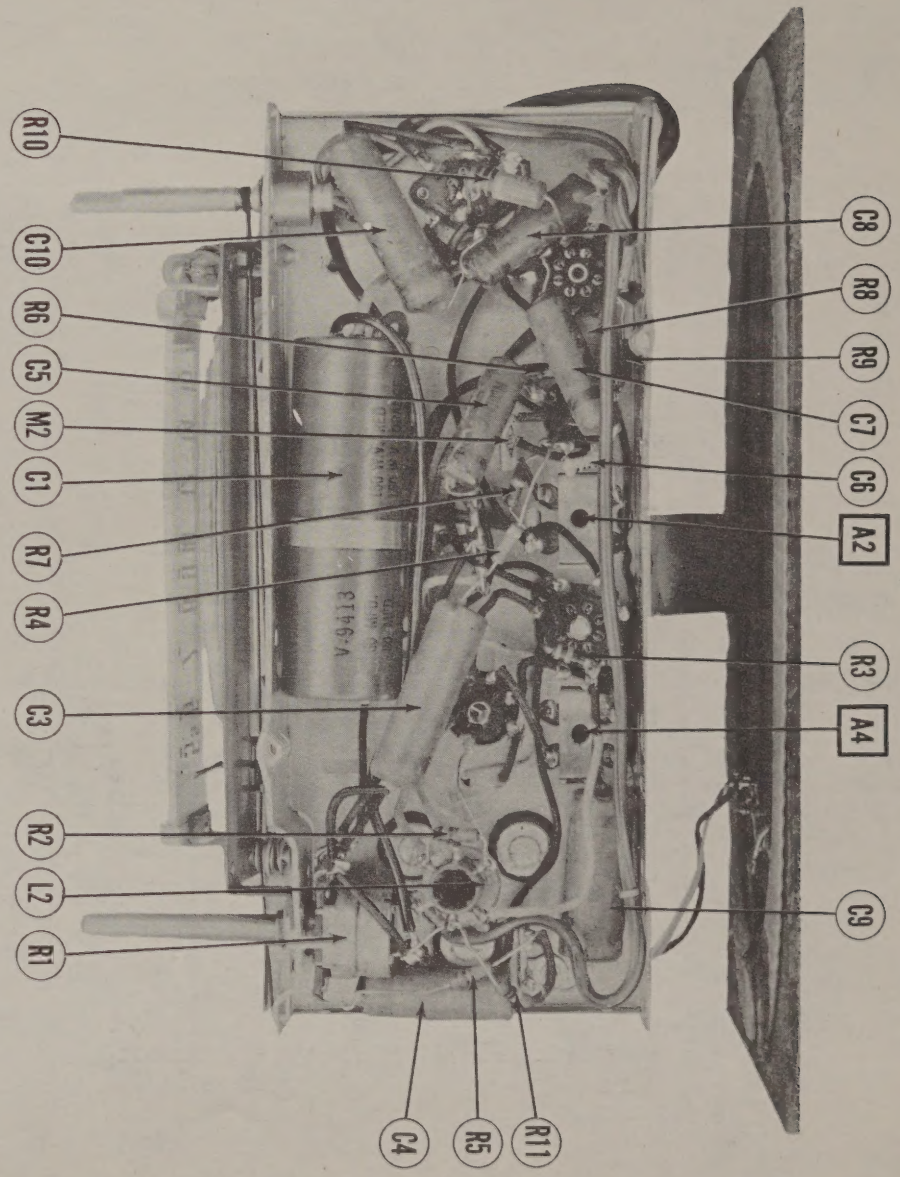
MISCELLANEOUS

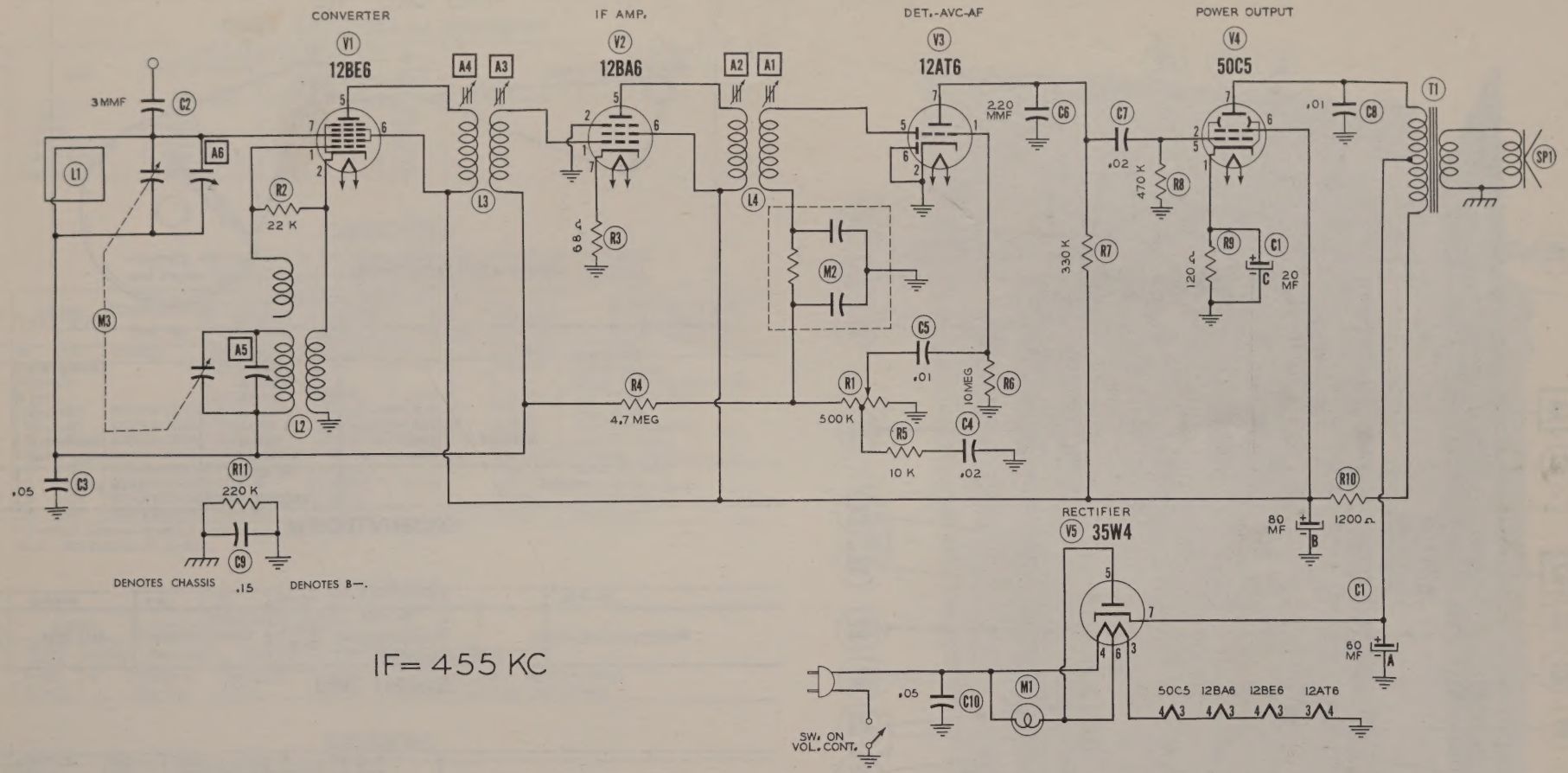
ITEM No.	PART NAME	WESTINGHOUSE PART No.	NOTES
M2	Diode Filter	V-6232-2	
M3	2 Gang Var. Cap.	V-9406	(25-435MMF, 16-107MMF)
	Cabinet	V-1181-5	Model H300T5
	Cabinet	V-1181-6	Model H301T5
	Dial	V-9407	
	Knob	V-6700-8	
	Dial Pointer	V-6690	



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





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VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	§-7.5VDC	0V.	12VAC	24VAC	90VDC	90VDC	-.2VDC
V 2	12BA6	-.2VDC	0V.	24VAC	36VAC	90VDC	90VDC	.7VDC
V 3	12AT6	-.8VDC	0V.	12VAC	0V.	-1.5VDC	0V.	45VDC
V 4	50C5	7.1VDC	.4VDC	36VAC	86VAC	.4VDC	90VDC	110VDC
V 5	35W4	0V.	123VDC	86VAC	117VAC	113VAC	113VAC	123VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.1Ω	12Ω	24Ω	†1.2KΩ	†1.2KΩ	5.2Meg.
V 2	12BA6	5.2 Meg.	0Ω	24Ω	36Ω	†1.2KΩ	†1.2KΩ	68Ω
V 3	12AT6	10 Meg.	0Ω	12Ω	0Ω	550KΩ	0Ω	†330KΩ
V 4	50C5	120Ω	470KΩ	36Ω	86Ω	470KΩ	†1.2KΩ	†260Ω
V 5	35W4	0Ω	†25Ω	86Ω	120Ω	110Ω	110Ω	55KΩ

† MEASURED FROM PIN 7 of V5.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.